INFRASTRUCTURE UPGRADATION PROJECT FOR CONSERVATION EDUCATION

Final Report

Submitted to

MMR Environment Improvement Society

Implemented by

Conservation Education Centre

Bombay Natural History Society

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Bombay Natural History Society: Conservation Education Centre

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SUMMARY

The Conservation Education Centre (CEC) is the knowledge trove of environment education. Situated amidst wilderness, the CEC represents the education wing of the Bombay Natural History Society (BNHS). On the event of its centenary celebration, the Government of Maharashtra had leased 33-acres of forested land to BNHS. The CEC came into existence on this land in 1997. Being one of the first centers to promote conservation education in Mumbai, CEC rose to fame with its unique formula of education and enjoyment. People from all walks of life visit the Centre throughout the year, and more than 10,000 people participate in a variety of conservation education activities conducted at CEC.

The Centre is fully equipped with equipment and education materials required to impart environment education among its audience. The Centre is visited by schools and colleges every year therefore there was need of to change the exhibits in tune to the changing times and issues. The MMR Environment Improvement Society Project has helped in revamping exhibition within CEC. A range of new exhibits as well as installations have been developed under this project which are serving to impart more interesting information to the visitors and generate curiosity for the Centre.

The following exhibits and installations were developed under the project.

Interactive Displays

1. Evolution
2. Bird Calls

Non-Interactive Displays

1. Endangered Wildlife
2. Butterflies of BNHS Land
3. Amphibians of BNHS Land
4. Insects of BNHS Land
5. Arachnids of BNHS Land
6. Trees of BNHS Land
7. Mammals of BNHS Land
8. Wildflowers of BNHS Land
9. Medicinal Plants of BNHS Land
10. Reptiles of BNHS Land
11. Moths of BNHS Land
12. About BNHS-CEC

Installations

1. Nature Trail Signage (5 no.)
2. Butterfly Bench for visitors
3. Green Deeds Game (Snake and Ladder)
4. Railing to Butterfly Garden

5. Railing to Nature Trail
6. Railing to Observatory on Terrace
7. Gate to Observatory on Terrace
8. Amphibian Pond
9. Marine Observatory Tank
10. Marine Display
11. Atlas Moth Mascot
12. Signage for Butterfly Garden (no.15 + Title)
13. Portraits of different Habitat of India (10 no.)
14. Wildlife Dioramas: Leopard, Sambar Deer, Spotted Deer (2), Barking Deer, Mongoose, Wild Boar, Hanuman Langur, Crested Serpent Eagle, Drongo, Paradise Flycatcher with nest , Sun Bird with nest, Tailor Bird with nest, Weaver Bird with nest and Horn Bill with nest.

Field Guides for BNHS Reserve

1. Trees and Wild Flowers
2. Birds
3. Insects
4. Moths
5. Butterflies

Educational trunks

1. Plant Life
2. Insect Life
3. Endangered Life
4. Bird Life
5. Environment

Bombay Natural History Society: Conservation Education Centre

INTRODUCTION

The Conservation Education Centre (CEC) is the knowledge trove of environment education. Situated amidst wilderness, the CEC represents the education wing of the Bombay Natural History Society (BNHS). On the event of its centenary celebration, the Government of Maharashtra had leased 33-acres of forested land to BNHS. The CEC came into existence on this land in 1997. Over the years, the Centre has exuded radiance unique among its own kind. Being one of the first centers to promote conservation education in Mumbai, CEC rose to fame with its unique formula of education and enjoyment. The wild outdoors around the CEC mesmerize all who walk its paths and breathe its fresh air. The Centre's anthill-like building intrigues every visitor. An oasis of serenity, the Centre has attracted every nature lover from the city. People from all walks of life visit the Centre throughout the year, and more than 15,000 people participate in a variety of conservation education activities conducted here.

The Centre is fully equipped with equipment and education materials required to impart environment education among its audience. The different arenas of the Centre, the auditorium, discovery (activity) room, display room, open classroom, butterfly garden and wildlife watching hide offer its visitors an intermixture of learning experiences. The Centre offers a bouquet of programmes that brings its visitor closer to nature.

The Centre is visited by schools and colleges every year therefore there was need of changing the exhibits in tune to the changing time and issues. The MMR Environment Improvement Society Project has helped in revamping exhibition within CEC. A range of new exhibits as well as installations have been developed

under this project. The aim is impart more interesting information to the visitors and generate curiosity for the Centre.

The project started in June 2009 and was implemented in four stages:

1. Conceptualization of Exhibits
2. Content Generation for Exhibits
3. Development of Exhibits and Signage
4. Installation of Exhibits and Signage

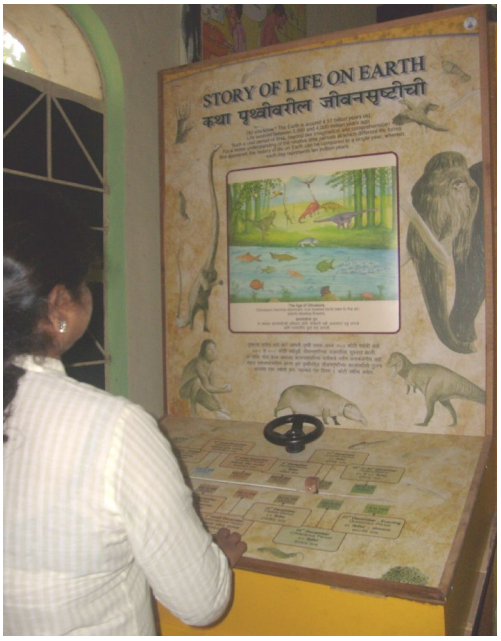
EDUCATIONAL EXHIBITS AND INSTALLATIONS

In order to renew the interest of the student community visiting the CEC, the exhibits and installations were developed on the formula of edutainment. Therefore diverse approaches have been used. These include:

I. Exhibits in and around CEC: A series of 14 thematic exhibits have been developed, of which two are interactive. The themes and details of each exhibit along with the size are given below:

[A] Interactive Exhibits:

1. **Evolution:** This is a mechanical interactive exhibit of size 3'X4' (vertical panel) 2'X3' (horizontal panel). The horizontal panel has a scale and sliding lever to mark the different eras on it and a wheel to operate it. Once an era is selected by rotating the wheel, the screen on the vertical panel shows the related picture of that particular era. The horizontal panel also contains a switch which, when pressed, emits light behind the picture and allows the observer to read the names of the organisms. The panels are made of 12 mm thick plywood, laminated with 1 mm thick sun mica at exposed faces.



2. **Birds calls:** It is an electronic exhibit of size 6' X 4' having 12 different birds on both sides. On pressing the switch of the bird, the sound of that bird's call is be played for 10 seconds. The Exhibit is made of 12 mm thick plywood laminated with 1 mm thick sun mica.

[B] Non-Interactive Exhibit:

1. **Endangered Wildlife:** A plain exhibit of size 4'X3' printed in colour on vinyl, laminated and mounted on 3 mm thick sun board, fixed on a

wooden panel. The panel is made of 12 mm plywood and laminated with 1 mm thick sun mica. The exhibit contains 4 photographs & 2 illustrations.

2. **Butterflies of BNHS Land:** A plain exhibit of size 6'X4' printed in colour on vinyl, laminated and mounted on 3 mm thick sun board. The exhibit contains 20 photographs & 2 illustrations.

3. **Amphibians of BNHS Land:** A plain exhibit of size 4'X3' printed in colour on vinyl, laminated and mounted on 3 mm thick sun board. The exhibit contains 8 photographs.

4. **Insects of BNHS Land:** A plain exhibit of size 6'X4' printed in colour on vinyl, laminated and mounted on 3 mm thick sun board. The exhibit contains 17 photographs & 5 illustrations.

5. **Arachnids of BNHS Land:** A plain exhibit of size 4'X3' printed in colour on vinyl, laminated and mounted on 3 mm thick sun board. The exhibit contains 7 photographs.

6. **Trees of BNHS Land:** A plain exhibit of size 6'X3' printed in colour on vinyl, laminated and mounted on 3 mm thick sun board. The exhibit contains 11 photographs.

7. **Mammals of BNHS Land:** A plain exhibit of size 6'X3' printed in colour on vinyl, laminated and mounted on 3 mm thick sun board. The exhibit contains 7 photographs.

8. **Wildflowers of BNHS Land:** A plain exhibit of

size 6'X3' printed in colour on vinyl, laminated and mounted on 3 mm thick sun board. The exhibit contains 15 photographs.

9. **Medicinal Plants of BNHS Land:** A plain exhibit of size 4'X3' printed in colour on vinyl, laminated and mounted on 3 mm thick sun board. The exhibit contains 12 photographs.

10. **Reptiles of BNHS Land:** A plain exhibit of size 4'X3' printed in colour on vinyl, laminated and mounted on 3 mm thick sun board. The exhibit contains 9 photographs & 1 illustration.

11. **Moths of BNHS Land:** A plain exhibit of size 6'X3' printed in colour on vinyl, laminated and mounted on 3 mm thick sun board. The exhibit contains 16 photographs.

12. **About BNHS-CEC:** A wooden outdoor display made in sal wood frame of size of size 3 X 3 inches and display portion of teakwood planks. The height of the display is 7 feet and has a roof of clay tiles. The size of the display is be 6 X 4 feet. The display have text and picture printed on vinyl, laminated and mounted on an aluminum composite panel fixed up on the planks of display.

II. Installations around CEC Premises: In order to add educative value to CEC surroundings, following installations have been planned. These include;

[A] Outdoor Signage: There are five nature trails on BNHS land. Each nature trail has a particular name. In order to guide people along the pathways to a specific nature trail, nature trail signage is installed. Altogether five such signs have been developed. A title for CEC was also developed.

[B] Butterfly Bench for Children: A unique bench in the shape of a butterfly has been

developed to include fun element for children. The bench is installed outside CEC.

[C] Green Deeds Game: A game on snakes and ladder theme has been developed on a large canvas where the players will be actually moving on the game board as per their green choices.

[D] Nature Trail Installations: Two railings along the nature trail around CEC have been developed, one for the butterfly garden and the second for steps leading to the forest. The CEC terrace will be used for sky observation during residential camps, for the same a railing leading to terrace steps was installed in order to avoid any mishaps.

[E] Marine Observatory Tank: CEC is home to a variety of different habitats. It is not only a deciduous forest, but also highlights a stream ecosystem, a pond ecosystem and a grassland habitat. Since the only thing missing was a marine habitat, we have created a mini-marine environment in order to educate our visitors about the marine life and to give them a glimpse of life under the sea.

[F] Amphibian Pond: The pond observatory is built to study amphibians and aquatic life forms. The pond is representative of a freshwater ecosystem and naturally attracts amphibian life from the surrounding area. Thus, visitors get an up-close look at pond life and are able to witness the intricate, interconnected life that makes up a pond ecosystem.

[G] Nature Portraits: Ten blow-ups of different habitats found in India have been installed in the passages in order to educate our visitors about geographical diversity of India.

1. **Deciduous Forest**
2. **Himalayas**
3. **Western Ghats**
4. **Grasslands**
5. **Semi Arid Forest**
6. **Temperate Forests**
7. **Rainforests**
8. **Thar Hot Desert**
9. **Ladakh Cold Desert**
10. **Indian Islands**

[H] Signage for Butterfly Garden: 15 signs and a title for the butterfly garden were developed. The signage depicts the name of the plant in English and Marathi and specifies if it is a larval or nectar food plant.

[I] Wildlife Dioramas: The BNHS Reserve is home to many charismatic mammals, which are very elusive and therefore rarely sighted by visitors. Hence, life-sized wildlife dioramas of eight mammals, two birds and five bird nests along with the respective birds were developed. The list of animals is given below:

1. Mammals

i) Leopard

ii) Sambar Deer
iii) Spotted Deer (2 no.)
iv) Barking Deer
v) Mongoose
vi) Wild Boar
vii) Hanuman Langur

2. Birds

viii) Crested Serpent Eagle
ix) Racket tailed Drongo

3. Birds with nest

x) Paradise Flycatcher
xi) Sun Bird
xii) Tailor Bird
xiii) Weaver Bird
xiv) Hornbill

Hanuman Langur (top left), Hornbill (right), Wild Boar (bottom left)

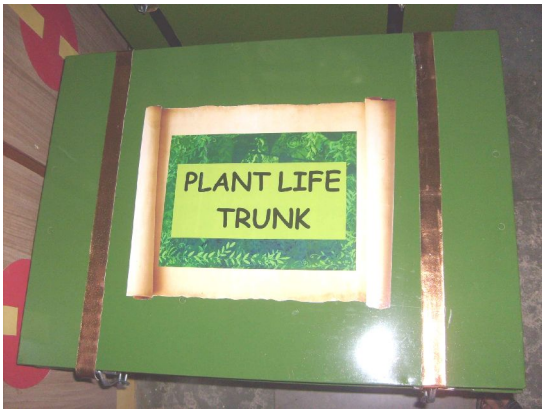
[J] Atlas Moth Mascot: An Atlas moth mascot has been developed and installed at the entrance of the centre to welcome visitors.

III. Field Guides: Five thematic field guides in the form of a folder have been developed. The themes include wildflowers, butterflies, insects, moths, birds and trees. 3000 copies of each field were developed, out of which 100 copies of each were sent to MMR Environment Improvement Society. The field Guides will be distributed free to CEC programme participants.

IV. Educational trunks: Five thematic educational trunks have been developed on themes such as endangered life, our environment, bird life, insect life and plant life. The trunks are an assortment of educational aids, which will be used for schools. Schools can hire these trunks and conduct the sessions. It is a unique educational tool which has been developed for the first time in India. The trunk consists the following:

[A] Plant Life Trunk:

1. Fact book
2. 5 Posters:-
    i. Types of Plants
    ii. Types of Bark
    iii. Types of Leaves and Fruits
    iv. Adaptations of Plants
    v. Carnivorous Plants



3. Activity Kit
4. Game Cards: 40 ‘Tree of Life’ cards
5. Quiz Cards
6. Puppet Show: 11 Hand Puppets
7. Flashcard Story: 12 large flashcards
8. Audio-Visual Aids: Plant-Animal Associations Multimedia
9. Reference Books
    i. Field Guide to Trees and Wildflowers of BNHS Reserve
    ii. Book of Indian Trees by K.C. Sahni
    iii. Book of Indian Wildlfowers by Isaac Kehimkar

[B] Insect Life Trunk:

1. Fact book
2. 5 Posters:-
    i. Body of an Insect
    ii. Insect Homes
    iii. Role of Insects
    iv. Life History of Insects
    v. Insect Superstars
3. Activity Kit
    i. 5 Insect Identifying Boxes
    ii. 5 Pairs of Forceps
    iii. 5 Magnifying Lenses
4. Game Cards
    i. Remember Me cards
    ii. Who am I? cards
5. Quiz Cards
6. Puppet Show: 8 hand puppets
7. Flashcard Story:- 15 large flashcards
8. Audio-Visual Aids
    i. Insects Multimedia
    ii. Small-talk Diaries
9. Reference Books
    i. Field Guides to Insects of BNHS Reserve
    ii. Field Guides to Butterflies of BNHS Reserve
    iii. Field Guides to Moths of BNHS Reserve
    iv. Book of Indian Butterflies by Isaac Kehimkar

[C] Endangered life Trunk:

1. Fact book
2. 5 Posters:-
    i. Food Chains
    ii. Extinction
    iii. Endangered and Threatened in India

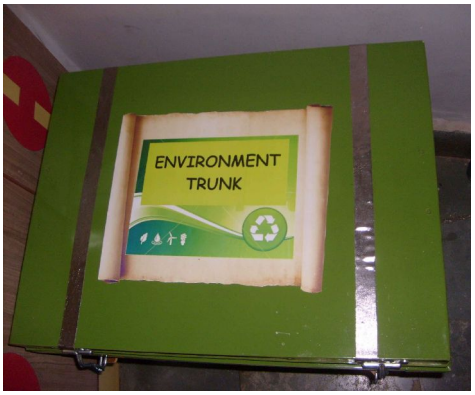
iv. Endangered Mammals of India
v. Trade in Wildlife

3. Game Cards
   i. 30 ‘Food Chain Chase’ cards
   ii. 16 double-sided ‘Caught in the Act’ cards
4. Quiz Cards
5. Puppet Show:- 9 hand-puppets, 3 chicks and 1 nest
6. Flashcard Story:- 15 large flashcards
7. Audio-Visual Aids:-
   i. Planet Earth DVD
   ii. Biodiversity AV
8. Reference Books
   i. Animals of India by S.H. Prater
   ii. Reptiles and Amphibian of India by J.C. Daniel
   iii. Green Guide

[D] Bird Life Trunk:

1. Fact book
2. 5 Posters:-
   i. Parts of a Bird
   ii. Bird Adaptations: Feet
   iii. Bird Adaptations: Beaks for eating
   iv. Bird Nests
   v. Life Cycle of a Bird
3. Activity Kit
   i. 5 Magnifying Lenses
   ii. Binoculars
   iii. Small Ziploc bags
   iv. 5 tweezers
   v. 5 blindfolds
4. Game Cards
   i. 6 ‘NEST’ cards
   ii. 4 ‘CAGE’ cards
5. Quiz Cards (12 cards)
6. Puppet Show
   i. 7 puppets
   ii. Props:- Cutout of boat, cutout of van, 3 chicks, 1 nest
7. Flashcard Story: - 12 large flashcards
8. Audio-Visual Aids: - Bird AV
9. Reference Books
   i. The Book of Indian Birds by Dr. Salim Ali
   ii. Field Guide to Birds of BNHS Reserve

[E] Environment Trunk



1. Fact book
2. 5 Posters:-
    i. Green Deeds
    ii. Rainwater Harvesting and Composting
    iii. The Magic of 3 R's- Reduce
    iv. Reuse
    v. Recycle
3. Activity Kit
    i. Rolls of broad double-sided tape.
    ii. 5 Magnifying glasses
    iii. Litmus paper (blue + red)
    iv. Muslin cloth (5)
4. Game Cards
    i. 2 Water Wars cards:- 'WATER AVAILABLE' and 'WATER USED'
    ii. 100 Resource Round-up cards:- 25 each of water, air, food and shelter
5. Quiz Cards
6. Puppet Show: - 12 puppets
7. Flashcard Story: - 13 large flashcards
8. Audio-Visual Aids
    i. Our Environment AV
    ii. An Inconvenient Truth
9. Reference Books
    i. Green Guide
    ii. In Harmony with Nature
    iii. Young Rangers

Trunk Material

Bombay Natural History Society: Conservation Education Centre

BUDGET

The total project cost was Rs. 20 lakhs. The project budget is given in the table below:

Particulars	**Name**	**Input**	**Honorarium**	**Total (in Rs.)**
(i) Staff Costs				**2,75,000**
Team Leader	V. Shubhalaxmi, Center Manager	Designing and monitoring of the project	Rs.1000/- x 150 days	1,50,000
Resource Persons	Mrs. Alka Vaidya/Ms. Saroja Hadpad	Marathi Translation and editing		5,000
Juniors/Assts	Priti Choghale, Education Officer	Content generation and implementing the project	Rs. 10000/- x 12 months	1,20,000
ii) **Development of Exhibits**	Development of interactive as well as plain exhibits/ dioramas/ aquarium/ signage/ thematic gardens/ observatories etc in and around CEC			**17,00,000**
(iv) Travel and consumables	Staff allowance (travel, overtime) and vehicle hiring charges			**5,000**
(v) Others	General postage, communication, photocopying, report making and maintenance of exhibits.			**20,000**
Total Project Cost				**20,00,000**

PROJECT RESULTS

A survey was conducted to see the effectiveness of the exhibits wherein a feedback form was given to the students visiting CEC in which they had to rate all the exhibits and installations from 1 to 5 (5= Excellent, 4= Very Good, 3= Good, 2= Average, 1= Fair).

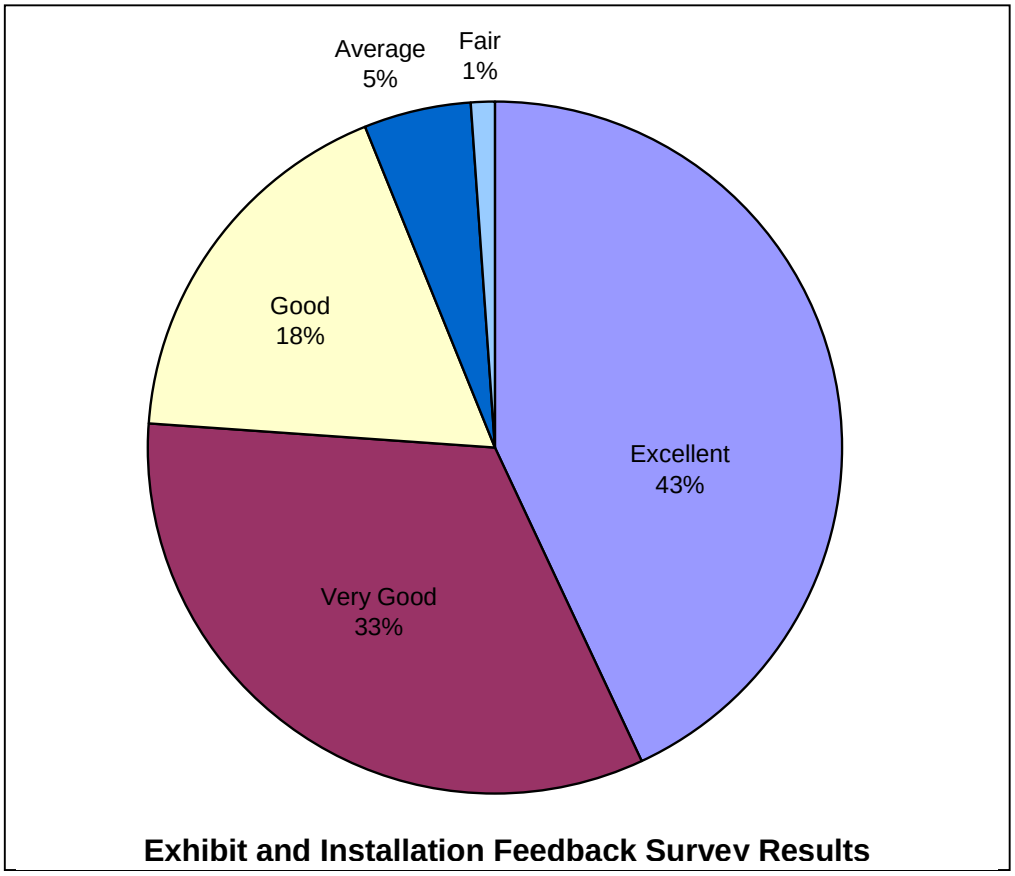


Exhibit and Installation Feedback Survev Results

I. Effectiveness of the Displays: The displays scored well on all aspects, with visitors finding them attractive, interesting, and enjoyable. Children especially liked the interactive displays as they were hands-on i.e. they can see the whole process of evolution in the Evolution display and can hear the different bird-calls in Bird call display.

II. Effectiveness of the Marine Aquarium, Amphibian Pond and Butterfly Garden:

[A] Marine Aquarium: The aquarium received a mixed rating, but still scored high for creating interest in marine life and in learning about marine ecosystems. Due to shy creatures, the variety of life may sometimes not look abundant.

[B] Amphibian Pond: The pond observatory also received good feedback, with high scores for learning and creating interest in amphibians and freshwater ecosystems. The visibility of the pond has been improved by clearing out intruding branches and the variety of life will naturally increase in wetter seasons.

[C] Butterfly Garden: The butterfly garden scored well on all accounts. The highest ratings were given to the aspects of learning about butterflies and creation of interest in this topic.
In almost all the exhibits, learning and creation of interest in the topics scored the highest. Therefore, it can be seen that the main objectives of imparting education and creation of awareness and interest through these exhibits have been successfully achieved.

III. Effectiveness of the Educational trunks: The different games from the educational trunks were carried out for different school children who visited CEC in the last few months. It was observed that the children enjoyed these games and learned many complicated things in an easy way. Many of the activities and projects were carried out with groups visiting CEC and these were also met with a very favourable response.

CONCLUSION

The project has helped us immensely as we were able to upgrade our infrastructure, which is widely used throughout the year by over 10,000 people. The highlights have been the interactive displays, wildlife dioramas, amphibian pond and the marine tank, which are enjoyed and appreciated by both children and adults. The butterfly garden donned with the new, attractive signage gave it a completely new look. People are amazed to see the life size dioramas of the animals and the langur installed on the tree.

The field guides have been a unique addition to conservation education in India. These innovative and attractive brochures have been greatly coveted by visitors and volunteers alike, with people enthusiastically picking up multiple copies to use during their CEC visits and to share with friends and family back home.

The educational trunks have also been the centre point of much excitement as they are the first of their kind to be available in India. A veritable treasure of knowledge, games and crafts, these trunks are sure to be a benchmark in the field of conservation education.

The project has breathed new life into CEC and enlivened its spirit. Not only are visitors enthralled by the new and wonderful additions, but the volunteers and staff as well have found renewed enthusiasm and vigour for imparting conservation education. The new exhibits, installations and materials, developed through this project, have already proven to be successful and have brought CEC closer to achieving the ultimate goal i.e. dynamic and quality nature education through hands-on experiences that remain embedded in the minds and hearts of all.

A. EDUCATIONAL EXHIBITS


We are Mammals too
आपणही सस्तन प्राणी आहोत
Did you know that India is the only country that is the home of three big cats? Namely lion, tiger and leopard. Leopard is the largest predator on BNHS reserve. Mammals get their name due to presence of mammary glands in females. India has about 397 species of mammals and over 85 species in Maharashtra. The largest mammal in India is the Blue Whale measuring over 34 metres and the smallest is the Eurasian Pygmy Shrew measuring only about 2 inches. BNHS Reserve supports a small population of mammals.
आपणास माहित आहे का? भारत हा एकमेव असा देश आहे की, ज्यात वाघ, सिंह, बिबटया हे तीन मोठे मार्जार वर्गीय प्राणी आढळतात. बी. एन. एच. एस. च्या राखीव भागात बिबटया हा मोठा भक्षक आहे. माद्यांमध्ये स्तनधारी पेशी असल्याने सस्तन हे नाव पडले. भारतामध्ये सस्तन प्राण्यांच्या ३९७ प्रजाती आहेत तर महाराष्ट्रात ८५ प्रजाती आहेत. भारतातील सर्वात मोठा सस्तन प्राणी म्हणजे 'ब्लू व्हेल' साधा त्याची लांबी ३४ मी. असते. तर सर्वात छोटा सस्तन प्राणी 'युरेशियन पिग्मी चिचुंद्री' हीची लांबी फक्त २ इंच असते. बी. एन. एच. एस.चे राखीव जंगल हे अनेक छोटया सस्तन प्राण्यांचे आश्रयस्थान आहे.
Carnivores / Carnivorous Mammals
Carnivore mammals control population of weaker animals
A small group of mammals are hunters and prey on other animals. They weed out weak animals, thus restoring a healthy gene pool in the forest. They are equipped with powerful jaws and claws.
मांसाहारी / मांसाहारी सस्तन प्राणी
सशक्त मांसाहारी सस्तन प्राणी अशक्त प्राण्यांची संख्या काबुत ठेवतात. सस्तन प्राण्यांचा छोटा गट मांसाहारी आहे. ते इतर प्राण्यांची शिकार करीत असल्याने जंगलातील जनुक साठा निरोगी राहतो. शिकारीसाठी त्यांना शक्तिशाली जबडा व नखरा यांची देणगी मिळालेली आहे.
Indian Mongoose
Specializes in eating bird eggs.
भारतीय मुंगुस
पक्षांची अंडी खाण्यात तरबेज.
Asian Palm Civet
A nocturnal hunter of small animals.
पाम सिवेट
निशाचर, छोटे प्राणी खाते.
Rusty Spotted Cat
An endangered cat, feeds on rodents, birds and lizards.
तांबुस ठिपक्यांची मांजर
एक संकटग्रस्त मांजर जी उंदीर, घुशी सारखे प्राणी व छोटे पक्षी खाते.
Photo Credits: Isaac Kehimkar, Nayan Khanolkar, Sachin Rai, Mayur Kamath, Dr. V. Shobhakhmi
Herbivores / Herbivorous Mammals
Herbivore mammals are food for carnivoros.
A large group of mammals are plant-eating. They feed on different parts of the plants, including the roots. They form the prey base for carnivorous animals.
तृणभक्षी / तृणभक्षीय सस्तन प्राणी
तृणभक्षीय प्राणी मांसाहारी प्राण्यांचे अन्न आहेत. बरेच सस्तन प्राणी वनस्पती भक्षण करणारे आहेत. वनस्पतीचे वेगवेगळे भाग अगदी मुळे सुध्दा खातात. मांसाहारी प्राण्यांचे मोठया प्रमाणातील भक्ष आहे.
Hanuman Langur
Gives out an alarm call on sighting a predator.
हनुमान लंगुर
भक्षक दिसला असता भोवताने धोक्याची सूचना देतो.
Barking Deer
A deer that 'barks'.
भेकर
हे हरीण भुंकल्यासारखा आवाज करते.
Wild Boar
Fond of plant tubers.
रानडुकर
वनस्पतीचे कंद हे याचे आवडते खाद्य.
Sambar
The largest deer found on BNHS reserve.
सांबर
बी. एन. एच. एस. च्या राखीव भागात आढळणारे सर्वात मोठे हरीण.
Man-animal conflict : the loser is the Leopard!
Man-animal conflict is emerging as a major concern in recent years at the Sanjay Gandhi National Park, where leopard attacks on humans are becoming common, leopards venture out of the Park towards the human settlements seeking out stray dogs as easy prey due to shortage of natural food in the Park. Unfortunately, at times, leopards attack children and squatting humans, mistaking them for dogs. Humans, in retaliation and self-defense, hunt down the leopard and often kill it. At other times, a hapless leopard gets hit by speeding vehicles. A viable solution needs to be found to resolve this man-animal conflict without jeopardizing either side.
मानव – प्राणी द्वंद्व : बिबटयाची हार
सध्याकाळात संजय गांधी राष्ट्रीय उद्यानात मनुष्य व प्राणी यांच्यातील लढा हा काळजीचा विषय झालेला आहे. हमे बिबटयाने मनुष्यवस्तीवर हल्ला करणे नित्याचे झाले आहे. संजय गांधी राष्ट्रीय उद्यानाच्या सीमेलगतच मोठया प्रमाणावर बेकायदेशीर इमारतींची उभारणी होत असल्याने भटक्या कुत्र्यांची संख्या वाढली आहे. राष्ट्रीय उद्यानातले बिबटयांचे नैसर्गिक अन्न कमी झाल्याने बिबटे भटक्या हरीणवजा पोषोपचारात व हे भटके कुत्रे सहज त्यांच्या जाळक्षीत सापडतात. दुर्दैवाने कुत्र्यांवरोबरच मनुष्य वस्त्यास वसलेले लोक व मुले बाला बळी पडत आहेत. बिबटयाना आपल्या हद्दीबाहेर शक्तलून देण्याशाठी मग स्थानिक रहिवाशी बन्याचदा त्यांची हत्या करतात. दोन्ही बाजुचा साराशर विचार करुन दोघांनाही न दुखावता यातून मार्ग काढणे आवश्यक बनले आहे.
To learn more about your local mammals, visit your nearest national park or wildlife sanctuary. Also read 'Book of Indian Animals' by Prater for more information.
आपल्या परिसरातील सस्तन प्राण्यांची अधिक माहिती मिळविण्याकरिता जवळच्या राष्ट्रीय उद्यानाला किंवा अभयारण्याला भेट द्या, तसेच 'बुक ऑफ इंडियन ॲनिमल्स' हे प्रेटरचे पुस्तक वाचा.

Trees are our Air conditioners
झाडे आपली एअर कंडिशनर्स आहेत

Do you know how much that ordinary looking tree in your locality is worth? Read on…
A tree that lives for 50 years generates Rs. 5.3 lakhs worth of oxygen, provides service worth Rs. 6.4 lakhs by controlling soil erosion and maintaining soil fertility, provides Rs. 5.3 lakhs worth of shelter for birds and animals. Intercepts an average of 760 gallons of rainfall a year and absorbs 4.5 kg of pollutants from the air each year. Besides, it provides flowers, fruits and timber. So, when even one tree is felled, the city loses something worth about Rs.32 lakhs! Shade from trees can cool buildings up to 20 degrees in the summer. So, have you got your natural 'air conditioner' yet?

तुम्हाला माहित आहे काय साधे दिसणारे तुमच्या आवारातील झाड किती किमती आहे ते?
नाही ना, मग हे वाचा
५० वर्षात एक झाड ५.३० लाख रुपये किमतीचा ऑक्सीजन निर्माण करते. मातीची धुप थांबवून सुपिकतेला हातभार लावण्याच्या एका झाडाच्या ५० वर्षांच्या सेवेचे मुल्य ६.४० लाख रुपये होते. ५० वर्षात एक झाड ५.३० लाख रुपये किंमतीचा निवारा पक्ष्यांना व प्राण्यांना देते. एका वर्षात ७६० गॅलन पावसाचे पाणी गतिरोधित करतेच पण ४.५ किलो प्रदुषके हवेतून शोषून घेते.
याखेरीज फुले, फळे, लाकुडही पुरविते. जेव्हा एक झाड नष्ट होते, तेव्हा आपले ३२ लाख रुपयांचे नुकसान होते.
उन्हाळ्यामध्ये झाडांच्या सावलीमुळे इमारतीचे तापमान २० डिग्री पर्यंत खाली येऊ शकते.
तुमच्या कडे ही नैसर्गिक एअर कंडीशनर्स आहेत का?

Evergreen trees have leaves throughout the year
These trees have a well-developed root system and only a few leaves are shed and replaced at any time. The BNHS reserved is sparsely dotted by a few evergreen trees.
सदाहरित झाडांची पाने उन्हाळ्यातही हिरवेगार असतात
या वृक्षांची मुळे पूर्ण विकसित असल्याने काही पाने गळून त्या जागी नविन पाने येतात. बी. एन. एच. एस.च्या भागात सोडीशी असलेली ही सदाहरित झाडे.

Deciduous trees are leafless in summer
These trees are shallow-rooted and therefore in dry seasons, they shed all leaves to conserve water. Many deciduous plants flower during this leafless period. The BNHS reserve is dominated by a variety of deciduous trees.
वसंतातील पानगळ
पानगळी झाडांची मुळे आखुड असतात. त्यामुळे शुष्क काळात पाणी टिकवून धरण्यासाठी झाडांची पाने गळून पडतात. ह्या पर्णविरहित काळात ती फुलून येतात.
बी. एन. एच. एस.च्या ह्या राखीव भागात अनेक पानझडी वृक्ष आहेत.

Gardenia
Fragrant flowers scent the forest ways.
डिकेमाली
जंगलातील रस्त्याच्या कडेला याच्या फुलांचा सुगंध दरवळत असतो.

Soccer Ball Tree
Fruit is a fusion of eight flowers and has emetic properties.
चायटी
आठ फुलांच्या मिलाफाने फळ तयार होते. ही फळे वांतीकारक आहेत.

Indian Coral Tree
Flowers are pollinated by sunbirds and starlings.
पांगारा
पूर्णक्षाकडून परागीकरण होते.

Ghost Tree
The only tree with a 'winter coat' of shiny white bark.
करई
हिवाळ्यात याचे चमकदार पांढरे खोड 'सफेद कोट' घातल्यासारखे भासते.

Sand-paper Tree
A natural 'polish paper' used in olden days.
करवती
पूर्वीच्या काळी याच्या खरखरीत पानांचा वापर पॉलिश पेपर म्हणून करीत असत.

White Ixora
Flowers are pollinated by moths.
बकाळ पांढरी
पतंगाकडून परागीकरण होते.

Tree of Damocles
Flowers are pollinated by bats.
देठू
वटवाघुळांकडून परागीकरण होते.

Red Silk-cotton Tree
Tree prickles cure pimples.
चायर
झाडाचे काटे मुरुमांसाठी औषध म्हणून वापरतात.

Indian Rosewood
Wood used for making musical instruments.
रोझवूड
याचे वनविण्यासाठी याचे लाकुड उपयोगी पडते.

Bonfire Tree
Flowers appear like a 'bonfire'.
फोणी
अग्नीज्वालांसारखी फुले येतात.

Teak
The termite-resistant tree.
साग
वाळवी प्रतिबंधक वृक्ष.

Would you like to give a Toast to Trees?
Every February, CEC conducts this half-day program to create awareness about various trees.
तुम्हाला झाडांचे अभिष्टचिंतन करायचे आहे काय?
दर फेब्रुवारीत सी. ई. सी. मध्ये झाडांबद्दल माहिती देण्याचा कार्यक्रम 'टोस्ट टू ट्री' आयोजित केला जातो.

To learn more about trees please read 'The Book of Indian Trees' by K. C. Sahni.
झाडांबद्दल अधिक माहिती मिळविण्यासाठी 'दी बुक ऑफ इंडीयन ट्रीज्' हे के. सी. सहानी यांचे पुस्तक वाचा.

Photo Credits : Sanjay Haldipur, V. Shubhalaxmi, Yogita Pednekar, Rushikesh Charan


Moths are cousins of Butterflies
पतंग फुलपाखरांचे चुलतबंधू
Did you know? Moths are older to butterflies than 100 million years as they evolved first on Earth. Being mostly nocturnal they differ from butterflies mainly in their antennae not being club-tipped. Over 170,000 species are known in the world, of which about 15,000 may be found in India. There are more than 45 moth groups. The BNHS Reserve is home to several moths.
तुम्हाला माहित आहे का? फुलपाखरांच्याही आधी १० लाख वर्षांपूर्वी पतंग अस्तित्वात आले. हे निशाचर असून ह्यांच्या स्पृशा फुलपाखरांच्या स्पृशांप्रमाणे सोटयाच्या आकाराच्या नसतात. जगात यांच्या १,७०,००० प्रजाती माहित आहेत. भारतात साधारण १५,००० प्रजाती आढळतात. पतंगांचे ४५ पेक्षा जास्त गट आहेत. बी. एन. एच. एस.च्या राखीव भागात खूप पतंग आढळतात.
Fasting moths
In many moth species, the adults lack mouthparts. These non-feeding adult moths rely on energy from the fat stored in their bodies during their caterpillar stage. They have short lifespan of just a few days or weeks.
उपवास करणारा पतंग
पतंगांच्या बऱ्याच प्रजातीमध्ये तोंडाचा भागच नसतो. सुरवंटाच्या अवस्थेत असताना गोळा प्रमाणात चरबी साठवून त्यानंतर त्या उर्जेवर अवलंबून असतात. त्यांचे आयुष्य काही दिवसांचे वा काही आठवड्यांचे असते.
Monkey Moth
A moth that plays dead when handled.
मर्कट पतंग
हाताळले असता मरण्याची नक्कल करतो.
Lappet Moth
A moth with unique resting posture.
लॅपेट पतंग
बसण्याची अनोखी तऱ्हा असलेला पतंग.
Slug Moth
The caterpillars are nettle-like.
स्लग पतंग
काटेरी सुरवंट.
Atlas Moth
The largest moth of the world with wing span of 30cm.
ऍटलास पतंग
३०सेंमी रुंदीचा जगातील सर्वात मोठा पतंग.
Moths with a mask!
Some moths sport interesting masks from which their common names are derived.
मुखवटा असलेले पतंग
शत्रुपासून बचावाकरीता मुखवटा धारण करतात.
Death - head Hawkmoth
Wears a skull-like mark on its thorax.
कवटी पतंग
याच्या अंगावर कवटी सारखे चिन्ह असते.
Owl Moth
A scarecrow for smaller birds.
घुबड पतंग
शत्रुला घाबरविणारा.
Owlet Moth
A smaller version of owl moth.
आऊलेट पतंग
घुबड पतंगाची छोटी आवृत्ती.
Moths on day shift!
Some moths are active during daytime, such as those that mimic bees and wasps.
दिवस पाळीचे पतंग
काही पतंग दिवस कार्यरत अवस्तात ते मधमाशी किंवा गांधीलमाशीची नक्कल करतात.
Blue Tiger Moth
Mimics the blue tiger butterfly.
ब्लू टायगर पतंग
हा ब्लू टायगर फुलपाखराची नक्कल करतो.
Painted Handmaiden Moth
A colourful moth flying under the grab of wasp.
पेंटेड हँडमेडन पतंग
माशीच्या वेशातील एक रंगीबेरंगी पतंग.
Bee Hawk-moth
The moth in a bee's clothing, feeds on flower nectar during day.
बी हॉक पतंग
फुलाच्या मधूसाठवर गुजराण करणारा मधमाशीसारखा दिसणारा पतंग.
Photo Credits : Isaac Kehimkar, V. Shubhalaxmi
Moths that remain invisible
Some moths protect themselves by mimicking objects from their surrounding.
अदृष्य पतंग
काही पतंग संरक्षणासाठी सभोवतालच्या एकादया गोष्टीची नक्कल करतात.
Lichen Moth
This moth usually rests on tree bark where it appears like a lichen.
शैवाळ पतंग
हा पतंग झाडाच्या खोडावर बसल्यास दगडफुलासारखा दिसतो.
Leaf Moth
The Moth is a perfect copy of a dried leaf fallen on ground.
पर्ण पतंग
हा पतंग सुकलेल्या पानासारखा दिसतो.
Broken twig moth
A perfect copy of dry twig.
ब्रोकन ट्विग पतंग
सुकलेल्या झाडाची फांदीच जणू.
Moths with 'Ears'
Some moths have 'ears' on the abdomen. These help them to detect ultrsonic waves emitted by insectivorous bats. Some, moths escape a bat-attack by changing their route. Others, reply back in warning.
कान असलेले पतंग
काही पतंगांच्या पोटावर कान असतात. हे पतंग कीटकभक्षी वटवाघुळांकडून येणाऱ्या अतिसुक्ष्म ध्वनीलहरी शोधून काढू शकतात. काही पतंग ऐनवेळी आपला मार्ग बदलून वटवाघुळांचे हल्ले परतवतात. तर इतर काही पतंग धोकादायक संदेश देतात.
Emerald Moth
Listens to the bat sounds with the help of 'ears' present on the last abdominal segment.
पाचू पतंग
पोटाच्या शेवटच्या भागावरील कानाने वटवाघुळांचे आवाज ऐकतो.
Tiger Moth
Pretty colours are not for attraction but for distraction.
टायगर पतंग
चमकदार रंग आकर्षणासाठी नव्हे तर इशाऱ्यासाठी
Would you like to study moths?
Get a 125 watts mercury lamp and a white cloth 3x3 m. Stretch the cloth between two pole facing a wild habitat. Hung the lamp in front of the cloth and switch it on after set. You could observe moths that get attracted to light till midnight.
तुम्हाला पतंगांचा अभ्यास करायचा आहे काय?
दिवेचा १२५ वॅटचा पारझरी बल्ब लावून रानातील अधिवासाच्या समोर ३ मीटर लांबी रुंदीचे पांढरे कापड लावा. सुर्यास्तानंतर दिवा चालू केल्यास रात्रभरापर्यंत पतंग दिव्याकडे आकर्षित होतील.
Would you like to enjoy a Meal with Moths?
Every September CEC conducts an overnight program inside the jungle to see and understand a variety of moths.
तुम्हाला पतंगांबरोबर भोजनानुभव घ्यायचा असल्यास दरवर्षी सप्टेंबरमध्ये सी. ई. सी. मध्ये रात्रभर जंगलात कार्यक्रम चालतो त्यात वेगवेगळे पतंग पहायला मिळतात.
Sericulture in India
India is the only country in the world that produces all five commercial varieties of silks on a large scale. India ranks second in the production of Tasar silk. Most silk is extracted from moth cocoons after boiling them to kill the moth inside. Eri is the only silk extracted without killing the moth.
भारतातील रेशीम उद्योग
भारत हा एकमेव असा देश आहे, जिथे व्यापार करण्यायोग्य ५ प्रकारचे रेशीम उत्पादित केले जाते. टसर रेशमाच्या उत्पादनात भारताचा दुसरा क्रमांक आहे. बरेचदा कोशांना उकळून त्यातील पतंग मारुन रेशीम काढले जाते. एरी हे एकमेव रेशीम असे आहे जे पतंग न मारता काढले जाते.

Bombay Natural History Society: Conservation Education Centre

Welcome to BNHS Reserve

Conservation Education Centre

CEC - An Open-Air Classroom

Welcome to the Conservation Education Centre (CEC) - the knowledge trove of Environment Education. Situated amidst wilderness, CEC represents the education wing of the Bombay Natural History Society (BNHS). On the event of its centenary celebration, the Government of Maharashtra leased out 33-acres of forest land to BNHS for the purpose of educating the masses on conservation. CEC has been operational since 1997. The Centre's anthill-like building intrigues every visitor. People from all walks of life visit the Centre throughout the year, and more than 15,000 people participate in a variety of conservation education activities conducted here. Come and explore the outer and inner worlds of CEC.

सी. ई. सी.-एक खुली पाठशाळा

भर जंगलात वसलेल्या संवर्धन शिक्षण केंद्रात आपले स्वागत असो. हे केंद्र बी. एन. एच. एस.च्या शैक्षणिक विभागाचे प्रतिक आहे. संस्थेच्या शतकपूर्ती वर्षाचे औचित्य साधून महाराष्ट्र शासनाने हे ३३ एकर जंगल संवर्धनाच्या लोकशिक्षणासाठी संस्थेला भाडेपट्टीने दिले. इ. स. १९९७ पासून हे केंद्र कार्यरत झाले. केंद्राची वारुळाच्या आकाराची इमारत प्रत्येक अभ्यागतात कुतुहल निर्माण करते. वेगवेगळ्या वयोगटातील लोक वर्षभर केंद्राला भेट देतात. तर १५,००० लोक वेगवेगळ्या संवर्धन शिक्षणाच्या कार्यक्रमात भाग घेतात.
या, व ह्या केंद्राच्या अंतर्गत आणि बाह्यजगाचा शोध घ्या . . .

Outer world of CEC

CEC is surrounded by a sprawling, undulating forest which changes with every season. Its proximity to the Sanjay Gandhi National Park is an added bonus, for much of the rich plant and animal life there flows into the Centre's environs.
This forest is also a home to some internationally acclaimed wildlife: the Atlas Moth (world's largest moth), the Painted Lady butterfly (a migrant butterfly) and the Crested Pied-Cuckoo (a migrant bird).

केंद्राचे बाह्यरंग

ऋतुमानाप्रमाणे बदलणारे अस्ताव्यस्त जंगल केंद्राभोवती पसरले आहे. संजय गांधी राष्ट्रीय उद्यानाचा शेजार हा या केंद्राला लाभलेली नैसर्गिक देणगी आहे. ज्यामुळे समृध्द वनसंपदा व वन्यजीव केंद्राच्या आवारात आढळतात.
हे जंगल अनेक आंतरराष्ट्रीय चित्रभ्रमिरींचे स्वप्न मान्यताप्राप्त वन्यजीवांचे आश्रयस्थान आहे. जगातील सर्वात मोठा ॲटलास पतंग येथे आढळतो. पेंटेड लेडी हे फुलपाखरु व चातक हे प्रवासी वन्यजीवही येथे आढळतात.

The main attraction of all CEC programmes is its 5 enthralling nature trails. So, for a rendezvous with nature, book your day with us today.

केंद्राच्या सर्व कार्यक्रमातील मुख्य आकर्षण म्हणजे ह्या परिसरातील पाच चित्तस्पर्शी निसर्ग भ्रमणे. ह्या निसर्गाचा वेध घेण्यासाठी या, आपला एक दिवस आमच्या सोबत घालवा.

Inner world of CEC

The centre is fully equipped with educational resources and equipment required to impart Conservation Education to its visitors. The different sections of the Centre - the auditorium, discovery (activity) room, display (exhibit) room, open classroom, marine aquarium, amphibian pond, butterfly garden and wildlife-watching hide - offer visitors a medley of different learning experiences. The Centre offers a bouquet of programmes that brings you closer to nature.

केंद्राचे अंतरंग

संवर्धन शिक्षणासाठी आवश्यक शैक्षणिक साहित्य आणि माध्यमांनी हे केंद्र सुसज्ज आहे. सभागृह, शोध कक्ष, प्रदर्शन कक्ष, खुली पाठशाला आणि फुलपाखरांचे उद्यान व समुद्री मत्स्यालय, भ्रमण परिक्रमा आणि वन्यप्राणी गुप्त निरिक्षका निसर्ग प्रेमींना एक समृध्द अनुभव देऊन जातात. केंद्र तुमच्यासाठी काही खास कार्यक्रमही आखीत असते. तुमच्या आवडीप्रमाणे तुम्ही त्यातील कार्यक्रम निवडू शकता.

Day Visits

The Centre offers half-day or full-day programmes for all age groups.

दिवसभराची भेट

सर्व वयोगटांसाठी केंद्रात पूर्ण दिवसाचे व अर्ध्या दिवसाचे कार्यक्रम आयोजित केले जातात.

Nature Camps

Every summer and winter, residential camps for students are held.

निसर्ग शिबीरे

दर हिवाळ्यात व उन्हाळ्यात विद्यार्थ्यांसाठी काही दिवसांची राहेवाशी शिबीरे आयोजित केली जातात.

Corporate Programmes

Catering to Corporate Social Responsibility towards our environment, CEC conducts specially customized interactive and thematic programmes for corporates.

कॉरपोरेट कार्यक्रम

वाणिज्य संस्थांची पर्यावरणाप्रती असलेल्या जबाबदारीची पूर्तता करण्यासाठी खास स्वरुपाचे विषयानुरुप कार्यक्रम, प्रकल्प, आगावू आरक्षण केल्यास आखले जातात.

Outreach Programmes

To spread the message of nature conservation far and wide, the Centre regularly conducts thematic audio-visual shows and day workshops in schools and colleges.

दुरस्थ कार्यक्रम

निसर्ग संवर्धनाचा संदेश सर्वदूर पोहचविण्यासाठी केंद्र सातत्याने शाळा, कॉलेजातून वेगवेगळ्या विषयावरील दृक्श्राव्य कार्यक्रम, दिवसभराचे कार्यक्रम, कार्यशाळा आयोजित करीत असते.

Special Events

CEC holds some of the most innovative programmes that glamorize the natural world and celebrate nature in each season. Such as 'Breakfast with Butterflies', 'Brunch with Birds', 'Bash with Bugs', 'Monsoon Magic' and so on.

खास कार्यक्रम

मनोरंजनात्मक तरीही शैक्षणिक असे कौटुंबिक स्वरुपाचे अनेक कार्यक्रम प्रत्येक ऋतुत केंद्रातर्फे राबवले जातात, जसे 'ब्रेक फास्ट विथ बटरफ्लाईज', 'ब्रन्च विथ बर्डस्' 'बॅश विथ बग्ज्' 'मान्सून मॅजीक' इ.

Distance Learning Courses

With a hobby-cum-learning approach, year-long courses such as 'Leadership Course in Bio-diversity Conservation' and Distance Learning Course in 'Basic Entomology' are conducted every year.

दुरस्थ अभ्यासक्रम

छंदातून शिक्षण हा दृष्टीकोन ठेऊन दरवर्षी वर्षभराचे अभ्यासक्रम जसे 'लिडरशीप कोर्स इन बायोडायवर्सिटी कॉझर्वेशन', 'डिस्टन्स लर्निंग कोर्स इन बेसीक इन्टोमोलॉजी' इ. आखले जातात.

Teacher Training Workshops

We conduct regular workshops for teachers to enhance their skills for environment education.

शिक्षक प्रशिक्षण कार्यशाळा

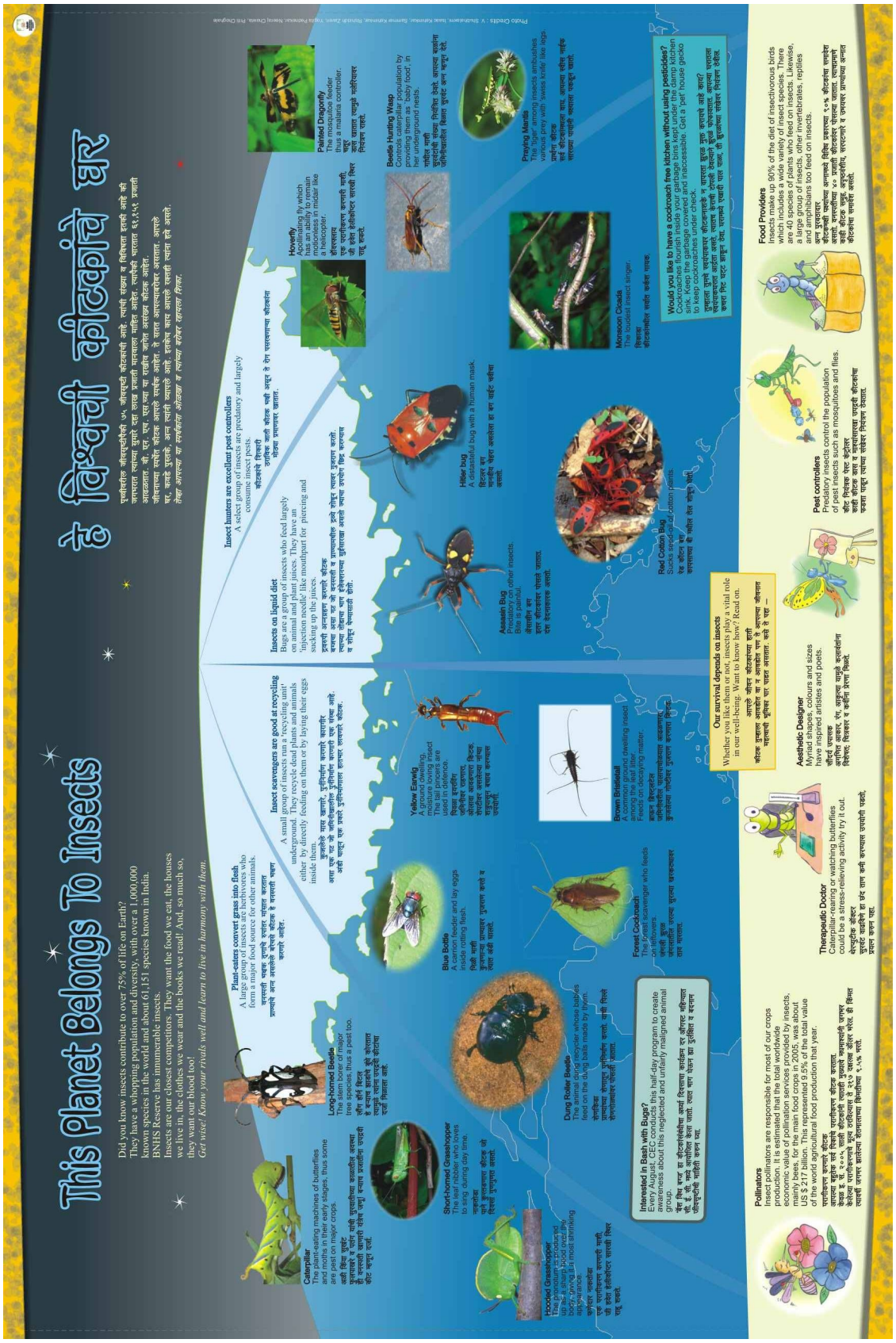
शिक्षकांची पर्यावरण शिक्षणविषयीची कार्यकुशलता यावविण्याच्या दृष्टीने केंद्रात सतत कार्यक्रम आयोजित केले जातात.

Volunteer Opportunities

The Centre derives its strength from a committed volunteers who help in conducting educational activities. Every April, a 'Volunteer Training Programme' is conducted to groom a new batch of volunteers.

स्वयंसेवकांना संधी

शैक्षणिक कार्यक्रम राबविण्यासाठी वचनबद्ध कर्तव्यनिष्ठ स्वयंसेवकांची फौज ही या केंद्राची खासियत आहे. दरवर्षी एप्रिल महिन्यात स्वयंसेवक प्रशिक्षण कार्यशाळा आयोजित करण्यात येते.


This Planet Belongs To Insects
Did you know insects contribute to over 75% of life on Earth? They have a whopping population and diversity, with over a 1,000,000 known species in the world and about 61,151 species known in India. BNHS Reserve has innumerable insects. Insects are our closest competitors. They want the food we eat, the houses we live in, the clothes we wear and the books we read! And, so much so, they want our blood too! Get wise! Know your rivals well and learn to live in harmony with them.
Caterpillar
The voracious eating machines of butterflies and moths in their early stages, thus some are pest on major crops.
Long-horned Beetle
The stem borer of major tree crops like a pest too.
Short-horned Grasshopper
The leaf nibbler who loves to sing during day time.
Hooded Grasshopper
The pronotum is produced up as a sharp hood over the body, which gives it a most disturbing appearance.
Interested in Bash with Bugs?
Every August, CEC conducts this half-day program to create awareness about this neglected and unfairly maligned animal group.
Dung Roller Beetle
The animal dung recycler whose babies feed on the dung balls made by them.
Forest Cockroach
The forest scavenger who feeds on leftovers.
Blue Bottle
A carrion feeder and lay eggs inside rotting flesh.
Yellow Earwig
A ground dwelling, moisture loving insect with a pair of pincers used in defence.
Brown Beetroot
A ground dwelling insect among the leaf litter. Feeds on decaying matter.
Plant-eaters convert grass into flesh
A large group of insects are herbivores who form a major food source for other animals.
Insect scavengers are good at recycling
A small group of insects run a recycling unit under the ground. They recycle dead animals either by directly feeding on them or by laying their eggs inside them.
Insects on liquid diet
Bugs are a group of insects who feed largely on animal and plant juices. They have an 'injection needle' like mouthpart for piercing and sucking up the juices.
Insect hunters are excellent pest controllers
A select group of insects are predatory and largely consume insect pests.
Assassin Bug
Predatory on other insects. Bite is painful.
Hider bug
A disguiseful bug with a human mask.
Red Cotton Bug
Sucks sap and also eat cotton seeds.
Hoverfly
Apalimating fly which has an ability to remain motionless in mid-air like a helicopter.
Painted Dragonfly
The mosquitoe feeder. Also is a malaria controller.
Beetle Hunting Wasp
Controls caterpillar population by providing them as 'baby food' in their underground nests.
Praying Mantis
The 'tiger' among insects ambushes various prey with 'swiss knife' like legs.
Monsoon Cicada
The loudest insect singer.
Our survival depends on insects
Whether you like them or not, insects play a vital role in our well-being. Want to know how? Read on.
Pollinators
Insect pollinators are responsible for most of our crops production. It is estimated that the total worldwide economic value of pollination services provided by insects, mainly bees, for the main food crops in 2005, was about 153 billion euros. This represents 9.5% of the total value of the world agricultural food production that year.
Therapeutic Doctor
Caterpillar-rearing or watching butterflies could be a stress-relieving activity try it out.
Aesthetic Designer
Myriad shapes, colours and sizes have inspired artistes and poets.
Pest controllers
Predatory insects control the population of pest insects such as mosquitoes and flies.
Food Providers
Insects constitute 90% of the diet of insectivorous birds which includes a wide variety of insect species. There are 40 species of plants who feed on insects. Likewise, a large group of insects, other invertebrates, reptiles and amphibians too feed on insects.
Would you like to have a cockroach free kitchen without using pesticides?
Cockroaches flourish inside your garbage bins kept under the damp kitchen sink. Keep the garbage covered and inaccessible. Get a pet house gecko to keep cockroaches under control.


Butterflies are bio-indicators
फुलपाखरे जीवदर्शक आहेत
Do you have butterflies as your neighbours?
If yes, then you are in a healthy habitat. Butterflies need pesticide-free vegetation with foodplants for caterpillars and nectar plants for adults.
Butterflies are 'ambassadors' of insect world.
There are five butterfly groups: Swallowtails, Whites and Yellows, Brush-footed, Blues and Skippers.
India has 1,501 species of butterflies of which 140 are found in Mumbai. BNHS reserve has several butterflies.
Blues - The 'two-headed' butterflies (521 species)
The second-largest butterfly group yet, with small wing area. Most of these sport a 'false head' to distract a predator's attention to a lesser vulnerable area such as wing tips.
Pea Blue
A small blue butterfly whose catterpillar feeds on pea plants hence the common name.
Red Pierrot
The Bryophyllum plant loving butterfly.
Silver Line
A unique blue butterfly with 'fake' head on the hind wing tips used to fool the predator.
Metallic Cerulean
Prefers hill forests, especially with plantation of its food plant, cardamom.
Whites and Yellows - The commonest butterflies (109 species)
A dominant group of medium-sized all-season butterflies. The males and females sometimes look different.
Great Orange Tip
The largest among the group.
Common Jezebel
The most colourful among the group.
Yellow Orange Tip
Fast flying common Pierid butterfly. Males and females look different. Females lack the bright yellow and orange wing colours.
Common Wanderer
The females mimic distasteful Glassy Tiger in appearance.
Brush-footed butterflies - Not always nectar feeders (Approx. 520 species)
The largest butterfly group yet, it is a diverse group that differ in looks, diets and defenses.
Common Nawab
Feeds on dead animal juices.
Blue Tiger
A distasteful butterfly for birds.
Commander
A territory patroller who would not allow other butterflies to trespass.
Blue Oakleaf
The 'flying leaf' escapes predatory attacks.
Common Evening Brown
A large brown butterfly active during dusk. It is attracted to light. In dry season forms there are no eyes spots on the wings.
Swallowtails - The tailed butterflies (107 species)
A group of gorgeous and large butterflies. Some of the rare swallowtails found in the Himalayas are endangered due to illegal collection.
Spot Sword Tail
More common in summer and winter months. Hind wings end into long sword like tail hence the name.
Crimson Rose
A distasteful butterfly for birds.
Common Mormon
A common garden visitor.
Blue Mormon
Large butterfly, local migrant from forested hilltops.
Skippers - Close cousins of moths (321 species)
A small group of primitive butterflies who look very similar to moths.
Grass Demon
Abundant during rains when Hill Turmeric, its favorite food plant is abundant.
Common Bush Brown
A small brown butterfly seen flying closer to the grpund. The eye spots on wings are not seen in summer form.
Orange Awlet
The butterfly with hooked antennae.
Would you like to invite butterflies to your home?
You could grow butterfly-attracting plants in your garden, such as Lantana, Periwinkle, Marigold, Curry leaves and Lemon. Butterflies will visit to seek nectar or to lay eggs.
Interested in having Breakfast with Butterflies?
Every October, CEC conducts this half-day program to create awareness about the flying beauties.
To learn more read 'The Book of Indian Butterflies' by Isaac Kehimkar.

VANISHING ANIMALS

लुप्त होणारे प्राणी

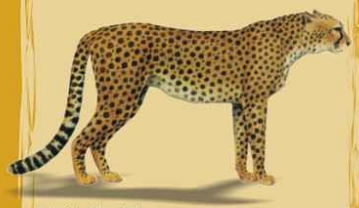
Did you know that globally, 15,589 species are known to be threatened with extinction?
Only 1.9 million species are known to science while 5 to 30 million species are estimated to exist.
Human activity, in the past 500 years has forced 844 species into extinction. Habitat loss and degradation afflict 86% of all threatened birds, 86% of mammals and 88% of threatened amphibians.
India ranks 2nd in terms of threatened mammals and 6th in terms of threatened birds.

तुम्हाला माहित आहे का, की पृथ्वीवरील १५,५८९ प्रजाती नष्ट होण्याच्या मार्गावर आहेत.
अंदाजे ५० लाख ते ३ कोटी संजीवाच्या प्रजाती आज अस्तित्वात आहेत. परंतू केवळ एकोणीस लाख प्रजातीच विज्ञानाला माहित आहेत.
मानवाच्या अवास्तव विकास कामांमूळे गेल्या ५०० वर्षात ८४४ प्रजाती नष्ट झाल्या आहेत. अधिवासाचा नाश व ऱ्हास यामुळे संकटग्रस्तांपैकी ८६% पक्षी, ८६% सस्तन प्राणी आणि ८८% उभयचर यांच्यावर प्रतिकूल परिणाम होत आहे. सर्वात जास्त संकटग्रस्त प्राणी असणाऱ्या देशांमध्ये भारताचा दुसरा क्रमांक तर संकटग्रस्त पक्षी असणाऱ्या देशांमध्ये सहावा क्रमांक लागतो.

Extinction means gone forever.
नष्टप्रद म्हणजे कायमचे नष्ट झालेले.

Pink-headed Duck
Extinct since 1890. Though sighted again in 1935, missing thereafter. Got extinct due to habitat destruction, hunting and trade.

गुलाबी डोक्याचे बदक
इ. स. १८९० पासून लुप्त झाले. इ. स. १९३५ साली पुन्हा दिसलेले हे बदक तेव्हापासून आजतागायत पुन्हा दिसलेले नाही. अधिवासाचा नाश, शिकार व व्यापार यामुळे हे बदक लुप्त झाले आहे.



Asiatic Cheetah
Earlier found in semi-arid grasslands of Central India. Extinct since 1949. Vanished due to habitat destruction and hunting.

आशियाई चित्ता
मध्य भारतात शुष्क, कोरड्या गवताळ जागी आढळणारा हा चित्ता इ. स. १९४९ पासून नष्ट झाला. शिकार व अधिवासाचा नाश यामुळे हा प्राणी नष्ट झाला आहे.

Threatened means these may join the queue to extinction.
धोकाग्रस्त म्हणजे नष्टप्रदांच्या रांगेत यांचा नंबर लागू शकतो.

Tiger
Saved from the verge of extinction in 1972 through Project Tiger. Today only about 3,500 tigers left in the world, of which 1,411 are in India. Endangered, due to habitat destruction, poaching and trade.

वाघ
व्याघ्र प्रकल्पामुळे इ.स. १९७२ साली नष्ट होण्यापासून वाघ वाचवला गेला. आज जगात ३५०० वाघ शिल्लक आहेत त्यापैकी १,४११ वाघ भारतात आहेत. अधिवासाचा नाश चोरटी शिकार व व्यापार यामुळे वाघ संकटग्रस्त झाला आहे.

White-backed Vulture
This common scavenger is no more seen. BNHS is striving to revive the lost population at its breeding centre in Pinjore, Harayana and Buxa. West Bengal. Endangered due to feeding on *Dichlofenac*, poisoned carcass BNHS managed to bring a ban on this pain killer drug which is now replaced by *Meloxicam*.

पांढऱ्या पाठीचे गिधाड
कुजलेले मांस खाणारा हा पक्षी सध्या विरळाच दिसतो. गुरांना वेदनाशामक म्हणून दिलेले 'डायक्लोफिर्नेक' हे औषध त्यांच्या मांसातून गिधाडांपर्यंत पोहोचते. त्यातील विषाच्या परिणामाने गिधाडे मरतात. परंतू आता बी. एन. एच. एस. च्या प्रयत्नाने हरियाणातील पिंजोर व पश्चिम बंगाल मधील बक्सा येथे प्रजनन केंद्रे सुरु झाली आहेत. बी. एन. एच. एस. च्या पुढाकाराने या औषधावर बंदी आणली गेली असून त्याऐवजी आता 'मेलेक्झीकॅम' वापरले जाते.

Endangered means there is still time to save these species.
संकटग्रस्त म्हणजे या प्रजातींना वाचवायला अजूनही वेळ आहे.

Indian Wild Buffalo
The only wild buffalo, found in Assam and Madhya Pradesh. Threatened due to habitat loss, genetic pollution by interbreeding with domestic varieties and epidemics spread through domestic stock.

भारतीय रानटी म्हैस
मध्यप्रदेश व आसाममध्ये आढळणारी एकमेव रानटी म्हैस. अधिवासाचा हीस, पाळीव प्राण्यांबरोबरच्या संयोगामुळे जनुकीय प्रदुषण झाल्याने तसेच पाळीव गुरांमधील रोग यांच्यांतही पसरत असल्याने ही धोकादायक झाली आहे.

Leopard
A highly adaptive wild cat found in all types of habitats. Threatened due to excessive illegal hunting, loss of prey, habitat destruction and persecution by man.

बिबट्या
परिस्थितीशी जुळवून घेणारा हा मार्जार वर्गीय प्राणी सर्व अधिवासात सापडतो. शिकार, भक्ष्याची कमतरता, अधिवासाचा नाश, मानवाकडून होणारा त्रास यामुळे धोक्यात आला आहे.

Photo Credits : Sachin Rai, Nayan Khanolkar

For more information read the Red Data Book published by International Union for Conservation of Nature and Natural Resources (IUCN).
अधिक माहितीकरिता 'इंटरनॅशनल युनियन फॉर कॉंझरवेशन ऑफ नेचर अँड नॅचरल रिसोर्सेस' ने प्रकाशित केलेले 'रेड डाटा बुक' वाचा.

Amphibians

The Story of Dual Lives

Did you know amphibians are indicators of your habitat?
Not hearing frog calls during monsoon may be an alarm call for your environment as it indicates dying ponds and high concentration of pollutants or pesticides in the water bodies.
Amphibians are unique animals with the ability to survive both on land and inside water. Having both skin and lungs as respiratory organs makes this possible. These include frogs, toads, salamanders, newts and caecilians. However, there are no Salamanders in India. There are 6,347 species in the world, of which about 285 species are found in India. 45 species are found in Maharashtra. BNHS Reserve support some of the commonest amphibians.

उभयचर

दोन जीवनांची कहाणी

उभयचर हे तुमच्या अधिवासाचे दर्शक आहेत हे तुम्हाला माहित आहे काय?
पावसाळ्यात जर का बेडकांचा आवाज तुम्ही ऐकत नसाल तर तुमच्या परिसंस्थेला ही धोकादायक सूचना आहे असे समजा. याचे कारण म्हणजे पाण्यातील जास्त प्रमाणातील कीटक नाशके, प्रदूषके आणि मृतवत झालेली जलाशये.
उभयचर हे असे वैशिष्ट्यपूर्ण प्राणी आहेत जे जमिनीवर तसेच पाण्यात जीवन व्यतीत करु शकतात. कातडी व फुप्फुसे या दोन्ही श्वासोच्छ्वास करणाऱ्या अवयवांमुळे हे शक्य होते. बेडुक, भेक, सालामंडर्स, न्युटस् व सिसिलियनचा ह्यात समावेश होतो, परंतू भारतात सालामंडर्स नाहीत. जगात एकूण ६,३४७ प्रजाती आढळतात तर भारतात २८५ प्रजाती आढळतात. त्यापैकी ४५ प्रजाती महाराष्ट्रात आढळतात. बी. एन. एच. एस.च्या या राखीव जंगलात काही सर्वसामान्य उभयचर आढळतात.

Frogs and Toads - *Tailless Jumping Jack*
Being carnivores they are excellent insect controllers. Frogs have smooth moist skins while toads have rough warty dry skins.

बेडूक व भेक - *शेपटी विरहीत 'जंपींग जॅक्स'.*
हे मांसाहारी असल्याने उत्तम कीटक नियंत्रक आहेत.
बेडकांची कातडी गुळगुळीत व आद्रता असलेली असते तर भेकांची कातडी खरखरीत व दाणेदार असते.

Indian Cricket Frog
A small frog with a cricket-like chirpy call.
इंडीयन क्रिकेट फ्रॉग
छोटा बेडूक जो नाकतोड्यासारखा आवाज करतो.

Leith's Frog
A diurnal rock-dwelling frog found in hilly areas.
लीथस् फ्रॉग
डोंगराळ भागात दिवसा आढळणारा हा बेडूक खडकावर राहतो.

Common Tree Frog
A frog that makes a frothy nest on trees hanging over water.
कॉमन ट्री फ्रॉग
पाण्याजवळील झाडावर याचे फेसाळ घरटे असते.

Common Indian Toad
The parotid glands behind the eyes emit irritating toxic liquid to deter predators.
कॉमन इंडीयन टोड
डोळ्यामागच्या पॅराटिड पेशीतून खाजणारे द्रव्य सोडतो ज्यामुळे शत्रुपासून बचाव होतो.

Frog legs - no more a delicacy
In 1970s, the Indian Bull Frog, largest among all Indian frogs, was mercilessly slaughtered and exported to the foreign countries where they are a delicacy. This commercial exploitation drastically reduced the number of frogs in agricultural fields, leading to a surge in population of crop pests. A three year long BNHS study showed that these frogs consumed insects four times their body weight. The Government of India then imposed a complete ban on the trade of frog legs in 1987. Mumbai University too put a stop to dissections of frogs.

बेडकांच्या तंगड्या - आता बेचव!
भारतातील सर्वात मोठा बेडूक बुलफ्रॉगच्या तंगड्यांना त्यांच्या चवदारपणामुळे परदेशात मोठी मागणी असे. या तंगड्यांच्या निर्यातीसाठी एकोणीसाव्या शतकातील सत्तरच्या दशकात भारतात बुलफ्रॉगच्या मोठ्या प्रमाणात हत्या झाल्या. परिणामी त्यांची संख्या घटली व शेतातील पीकांवर कीड पसरु लागली. बी. एन. एच. एस. ने सतत ३ वर्ष अभ्यास करुन असे सिध्द केले की, बुलफ्रॉगमुळे शेतातील कीटकांचे नियंत्रण होते. कारण बुलफ्रॉग स्वतःच्या वजनाच्या चौपट कीटक खातो. त्यानंतर १९८७ मध्ये भारत सरकारने बेडकांच्या तंगड्यांच्या निर्यातीवर बंदी आणली. मुंबई विद्यापिठाने बेडकांच्या व्यवच्छेदावरसुद्धा बंदी आणली.

Indian Burrowing Frog
A burrower seen only during the early monsoon months when they come to the surface to breed.
इंडीयन बरोईंग बेडूक
जमिनीखाली राहणारा बेडूक, पावसाळ्याच्या सुरुवातीला प्रजननासाठी जमिनी बाहेर येतो.

Fungoid Frog
Bright colour warns predators to keep off as it is poisonous.
फंगॉईड फ्रॉग
भडक रंगाने शत्रुला विषारी असल्याचे दर्शवितो.

Caecilians - *Legless amphibians*
These are burrowing amphibians and can easily be mistaken for earthworms or small snakes. Some lay eggs while some give birth to live young.
सिसिलियन - *पायविरहित उभयचर*
हे बीळ खणणारे उभयचर, गांडूळ किंवा छोट्या सापांसारखे दिसतात. काही अंडी घालतात तर काही पिल्ले जन्माला घालतात.

Bombay Caecilian
A forest denizen, feeds mainly on earthworms, termites, tiny snakes and soil animals.
बॉम्बे सिसिलियन
जंगलात आढळणारा हा सिसिलियन प्रामुख्याने गांडुळे, वाळवी, छोटे साप व मातीतील प्राणी खातो.

To learn more about amphibians read 'The Book of Indian Reptiles and Amphibians' by J. C. Daniel.
अधिक माहितीकरिता जे. सी. डॅनियल यांचे 'दी बुक ऑफ इंडीयन रेप्टाईल्स ऍन्ड ऍम्फीबियन्स' हे पुस्तक वाचा.

Photo Credits : Varad Giri, Sameer Kelhimkar, Isaac Kehimkar

Arachnids - 8 legged wonders
अष्टपाद - आठ पायांचे आश्चर्य

Hollywood movies such as Spiderman and Scorpion King have popularized a small yet mysterious group of animals called Arachnids. There are about 98,000 species found in the world, of which about 5,818 are found in India. BNHS Reserve support a good population of arachnids. Besides spiders and scorpions, it also includes ticks and mites. These 8-legged, creatures are close cousins of the 6-legged insects and the 10-legged crabs and lobsters.

स्पायडरमॅन व स्कॉरपियन किंग या हॉलीवूड मधील चित्रपटांमुळे हा गुढ भासणारा जीवसमूह लोकप्रिय झाला. जगभरात यांच्या ९८,००० प्रजाती सापडतात तर भारतात त्यापैकी ५,८१८ प्रजाती सापडतात. कोळी व विंचू या व्यतिरिक्त टिकस् आणि माईटस् हे देखील अष्टपाद वर्गात मोडतात. ६ पायांच्या कीटकांचे व १० पायांच्या खेकड्यांचे हे ८ पाय असणारे अष्टपाद चुलतभाऊ म्हणायला हरकत नाही.

Scorpions - *The sting effect*
Scorpions are close cousins of spiders but don't produce silk and have a stinging tail. They are nocturnal and feed largely on insects. Cannibalism is common.
विंचू . . . *डंखाचा परिणाम*
कोळ्यांचे चुलतभाऊच पण जाळी विणत नाहीत. दंश करणारी नांगी असते. निशाचर असून कीटक भक्षण करतात. एकमेकांनासुध्दा खातात.

Ticks and Mites - *The lesser known arachnids*
They differ from other arachnids in having oval bodies without any distinct head. being parasitic, they feed on plant and animal juices and are considered destructive to cultivation, cattle, poultry and humans.
टिकस् आणि माईटस्; *गोचिडा — अनोळखी अष्टपाद*
अष्टपाद वर्गातील इतरांपेक्षा वेगळ्या असतात. मस्तक व धड एकत्र असलेले अंडाकृती आकाराचे हे अष्टपाद इतरांहून वेगळे दिसतात. हे परजीवी असल्याने वनस्पती व प्राण्यांच्या शरीरातील द्रव्ये शोषतात म्हणून शेती, गुरे, माणसांना त्रासदायक ठरतात.

Spiders
Spinner of magical silk
Spiders are the only arachnids that secrete silk. This silk is mainly used for trapping prey. Not all spiders weave web. Spiders are carnivores and liquid-feeders. Most of them feed on insects, but some prey on birds too.
कोळी - *चमत्कारी रेशीम विणणारे कोष्टी*
अष्टपाद वर्गातले फक्त कोळीच जाळे विणू शकतात. हे रेशीम भक्ष्याला पकडण्याकरिता वापरले जाते. सर्व कोळी जाळे विणीत नाहीत; कोळी मांसाहारी तसेच द्रव शोषणारे असतात. काहीजण कीटक खातात तर काही पक्षीसुध्दा खातात.

Black Scorpion
The largest scorpion with a mild venom.
काळा विंचू
मोठा विंचू. विष फार जहाल नसते.

Tailless Whip Scorpion
Not a true scorpion but shares qualities of both spider and scorpion.
शेपटी विरहित विंचू
खरा विंचू नव्हेच पण कोळी व विंचवाचे काही गुण घेतलेले आहेत.

Giant Wood Spider
Largest among the web-weaving spiders.
जायंट वुड स्पायडर
जाळी विणणाऱ्या कोळ्यांमधील सर्वात मोठा कोळी.

Indian Tarantula
A bird-eating spider whose bite can be fatal for humans.
भारतीय टॅरांटूला
पक्षी खाणारा कोळी; मानवाला चावल्यास गंभीर इजा होऊ शकते.

Crab Spider
A well camouflaged hunting spider that hides among flowers to ambush prey.
क्रॅब स्पायडर
रंगगोपनामुळे फुलांमध्ये लपून भक्ष्यावर झडप घालतो.

Jumping Spider
A hunting spider that does not weave webs for catching prey.
जंपींग स्पायडर
जाळे न विणता शिकार करणारा.

Velvet Mite
An indicator of monsoon.
वेलव्हेट माईट
पावसाचा दूत

How does spider make its web?
कोळी जाळे कसे विणतो?

1 The spider releases a sticky thread.
कोळी एक चिकट धागा आपल्या शरीरातील ग्रंथीतून सोडतो.

2 That is blown away with the wind.If stuck forms the first bridge.
जो वाह्या बरोबर वाहून एकादया जागी चिकटल्यास जाळयाची पहिली कडी तयार होते.

3 After this the spider constructs a Y-shaped thread.
त्यानंतर कोळी Y आकाराची दुसरी कडी तयार करतो.

4 Around which a frame is constructed to which the other radii are attached.
या कडीच्या केंद्रबिंदुतून इतर अनेक त्रिज्या जुळत जातात.

5 After all the radii are completed the spider starts to make the circular threads.
सर्व त्रिज्या तयार झाल्यावर कोळी वर्तुळाकृती धागे विणत जातो.

6 Then the web is completed and the spider can rest and sit in the center of the web with her head down.
संपूर्ण वर्तुळ पूर्ण झाल्यावर डोके खालच्या दिशेला करुन कोळी जाळ्याच्या केंद्रभागी बसून राहतो.

Photo Credits : Philippe Moresco, Sameer Kehimkar, Isaac Kehimkar

Reptiles the descendents of dinosaurs
सरिसृप डायनोसॉरचे वारसदार

The Hollywood movie- Jurassic Park may have 'allowed' dinosaurs into our homes, yet many of us detest their descendents, especially lizards and snakes. In fact, these animals play an important role in curtailing populations of pests such as rats and insects.
Reptiles are animals with dry scales on their bodies. They include crocodiles, lizards, snakes, turtles, terrapins and tortoises. India has over 510 species of reptiles, 240 species of snakes, 150 lizards, 30 turtles and tortoises and 3 species of crocodiles. Maharashtra has over 90 species of reptiles.
The BNHS Reserve is home to several reptiles except turtles and tortoises.

ज्युरासिक पार्क ह्या हॉलीवुड मधील चित्रपटामुळे डायनोसॉर आपल्या घरात आले असले तरी त्यांच्या वारसांचा आपण तिरस्कार करतो. खरे पाहता हे प्राणी कीटक, उंदीर इ. खाऊन निसर्गचक्रात महत्वाची भुमिका बजावत असतात.
सरिसृप हे अंगावर शुष्क खवले असणारे प्राणी आहेत. यामध्ये मगरी, सुसरी, पाली, साप, समुद्री कासवे गोड्यापाण्यातील कासवे यांचा समावेश होतो. भारतात सरपटणाऱ्या प्राण्यांच्या ५१० प्रजाती आहेत यामध्ये २४० जातीचे साप, १५० जातींच्या पाली तर ३० जातीची कासवे व ३ जातींच्या मगरी आढळतात. महाराष्ट्रात सरिसृपांच्या ९० प्रजाती आढळतात. बी. एन. एस. एस.च्या राखीव भागात कासव वगळता इतर बरेच सरिसृप आढळतात.

Lizards - *A diverse group*
These are largely insect-eaters.
Some have ability to shed tails in case of danger.

पाली - *वैविध्यपूर्ण गट*
पाली मुख्यत्वे करुन कीटकभक्षी आहेत.
संकट समयी त्या शेपटी छाटून टाकतात.

Forest Calotes
Forest dweller, with vibrant male and dull female.
जंगली सरडा
जंगलात राहणारा भडक रंगाचा नर तर मादी निस्तेज रंगाची असते.

Snake Skink
A glossy lizard with snake-like body.
सापसुरळी
सापासारखी दिसणारी एक चकचकीत पाल.

Snakes - *The legless reptiles*
These are the most advanced reptiles. They sense their environment with the help of their forked tongue. They feed on both large and small animals. Indian Cobra, Common Krait, Russell's Viper and Saw-scaled Viper are the common venomous snakes known for most snake-bite fatalities in India.
साप - *पायविरहित सरिसृप*
हे प्रगत सरिसृप आहेत. दुभागलेल्या जीभेद्वारे सभोवतालच्या वातावरणाचा अंदाज घेतात. ते छोटे मोठे प्राणी खातात. भारतात नाग, मण्यार, घोणस व फुरसे ह्या विषारी सापांच्या दंशामुळे सगळ्यात जास्त मनुष्यहानी होते.

Spectacled Cobra
A venomous, yet most revered among snakes.
चष्मेधारी नाग
अतिविषारी साप, पण पुजनीय आहे.

Common Rat Snake
A common rat controller.
धामण
उंदरांची संख्या काबुत ठेवणारा साप.

Vine Snake
A mildly venomous tree-snake.
हरणटोळ
झाडावर आढळणारा कमविषारी साप.

Bamboo Pit Viper
A snake with thermal sensors for locating warm blooded prey.
हिरवा घोणस / चापडा
गरम रक्ताचे भक्ष शोधण्यासाठी या सापाच्या शरीरात उष्णता संवेदक ग्रंथी असतात.

Photo Credits : Sameer Kehimkar, Varad Giri, V Shubhalaxmi

Indian Monitor Lizard
An endangered lizard that hunts small animals.
घोरपड
संकटग्रस्त सरिसृप, छोटे प्राणी शिकार करुन खाते.

Rock Gecko
Large handsome lizard that is active at night, seen on and near rocky areas, that's why the common English name. Feeds mainly on insects but also eats other geckos.
खडक पाल
निशाचर असणारी देखणी अशी एक मोठी पाल. खडकाजवळ वास्तव्य असल्यामुळे नाव पडले आहे. प्रामुख्याने कीटक खाते पण इतर पालींना देखील खाते.

Indian Chameleon
Ability to change its body colour in responce to ambient light and temperatre for communication and expressing moods.
भारतीय कॅमेलियन
सरडा आजुबाजूचा प्रकाश व तापमानाप्रमाणे मनस्थिती प्रकट करण्यासाठी आपल्या शरीराचे रंग बदलतो.

Snake in your locality?
do not panic, say 'hi' to it and call the snake rescuers.
तुमच्या आवारात साप आला?
घाबरु नका, त्याला सलाम करा आणि एखाद्या सर्पमित्राला बोलावून त्या सापाला जंगलात नेऊन सोडा.

To learn more about reptiles read 'The Book of Indian Reptiles and Amphibians' by J.C. Daniel.
सरपटणाऱ्या प्राण्यांविषयी अधिक माहिती जाणून घेण्यासाठी 'बुक ऑफ इंडियन रेप्टाईल्स् अँड ऍम्फिबियन्स' हे जे. सी. डॅनियल यांचे पुस्तक वाचा.


VISIT OUR PHARMACY
आमच्या औषधालयाला भेट द्या
Did you know?
Every forest is a pharmacy as it hosts many plants with healing properties. Around 8,000 plant species are used in different medicine systems of India. Over 860 species are traded, 70% of them being collected from the wild. In Maharashtra, more than 2,000 plant species are known to have medicinal properties. On BNHS Reserve there are several medicinal plants.
तुम्हाला माहित आहे का की आपली वने ही आपली औषधालये आहेत. ज्यात रोग निवारक शक्ती असलेल्या अनेक वनस्पती आहेत. भारतात औषधोपचारांच्या विविध पध्दतींमध्ये साधारण ८०० प्रजातींच्या वनस्पती वापरतात. ८६० प्रजातींच्या वनस्पतींचा व्यापार होतो यातील ७०% रानातून गोळा केल्या जातात. महाराष्ट्रातील २,००० पेक्षा जास्त प्रजातींमध्ये औषधी गुणधर्म आहेत. बी. एन. एच. एस. च्या ह्या राखीव भागात पुष्कळ औषधी वनस्पती आहेत.
Hill Turmeric
Tuber has antibiotic effects.
सिंदरबार/शिंदलवन
याच्या कंदांमध्ये प्रतिजैविक गुणधर्म आढळतात.
Angled Sida
Leaves and roots are used against piles and gonorrhoea; considered as a diuretic, aphrodisiac; mucilage is used for scorpion sting.
सहादेवी
मुळ्याच्य व परमा बरे करण्यासाठी याची पाने व मुळे वापरतात. मूत्र साफ होणे तसेच कमजोरपणा घालविण्यासाठीही उत्तम. याचा चिकट रस विंचूदंशावर वापरतात.
Belliric Myrabolan
One of the ingredient of *Triphala Churna*; fruits are also used against cough, sore throat, scorpion sting and eye diseases.
बेहेडा
त्रिफळा चूर्णातील एक घटक. खोकला, घशाचे विकार, विचूदंश, नेत्रविकार याकरिता फळांचा वापर करतात.
Yellow Ground Star
Rhizome is used as an appetizer and for treatment of piles, biliousness and fatigue.
काळी मुसली
याचे कंद मुळव्याध, बिलीओसनेस थकवा यावर गुणकारी आहेत. तसेच ते भूक प्रदीप्त करण्यास वापरतात.
Soccer Ball Tree
Leaves are said to stabilize the blood sugar, fruits are used for indigestion.
बारतोंडी
याच्या पानात रक्तातील साखरेची पातळी स्थिर करण्याचे गुणधर्म आहेत. अपचनावर फळांचा उपयोग होतो.
Photo Credits : Yogita Pednekar, V. Shubhalaxmi, Saroja Hadpad
Spiral Ginger
Root is used against fevers, dyspepsia, worms and skin diseases.
कोष्ट/पेन्वा
ताप, अग्निमांद्य, अपचन कृमी व त्वचारोग बरे करण्यासाठी मुळांचा वापर केला जातो.
Indian Kudzu
Tubers are used to treat fevers, rheumatism, to reduce joint swellings and diminished lactation; it is an emetic, galactogogue and a tonic; is also used in treating leprosy and cancer.
भारडा / घोरवेल
कंदाचा उपयोग ताप, संधिवात, सूज व दूग्धन कमी करण्यास केला जातो. वांतीकारक, गेलॅक्टोगोग व शक्तिवर्धक म्हणूनही वापरतात. कुष्ठरोग व कर्करोगासाठी गुणकारी.
Phalsa
Stem bark is used to cure pneumonia, bronchitis, urinary disorders, dysentery and for relieving irritation from cow-itch plant.
धामण
खोडाची साल न्युमोनिया, फुफ्फुसांच्या नळयांची सूज (ब्रॉंकायटीस), अर्मांश, मुत्रविकार यावरील उपचारांकरीता तसेच खाज खुजलीच्या झाडापासून होणारी खाज कमी करण्यास वापरतात.
Indian Screw Tree
Fruits are demulcent, mildly astringent and useful against gripe and flatulence. Roots and bark are anti-bacterial and anti-fungal.
मुरुडशेंग
फळे थोडी तुरट पण मुरडा आणि वायुप्रकोपावर गुणकारी. तर मुळे व खोड सूक्ष्मजंतुरोधी व कवकरोधी.
Tinospora
Stem improves the immune system, useful in chronic fevers and rheumatoid arthritis
गुळवेल
देठामध्ये प्रतिकार शक्तिसुधारण्याचे गुणधर्म असून लांबलेला ताप व संधिवातासाठी उपयुक्त.
Easter Tree
Bark is used against dysentery and other gastric disorders and used as antihelmintic, stomachic, febrifuge.
पांढरा कुडा
साल अर्मांश, पोटाचे विकार व तापावर गुणकारी आहे.
Would you like to create your own medicinal garden?
Medicinal plants such as Tulsi, Mint, Adulsa, Asparagus, Aloe, etc. grow well in pots. Learning their medicinal values, these herbs can be used directly in home remedies.
तुम्हाला स्वतःची औषधबाग तयार करायची आहे काय?
तुळस, पुदीना, अडुळसा, शतावरी इ. वनस्पती आपण कुंडीत लावू शकता. त्यांचे औषधी गुणधर्म जाणून तुम्ही घरगुती उपायही करु शकता.
Medicinal value can be harmful to Medicinal plants!
It is ironic that plants that help us make life-saving drugs are not safe from us. The indiscriminate exploitation of many medicinal species has resulted in their local extinction from the wild. For instance, Glory Lily, once common in our jungles, is now rarely seen as its plant tubres have been collected for use in tradition medicine, alkaloid extraction for treating gout and cancer and for research. Cultivation and sustainable use of herble medicinal sources, such as the Glory Lily, will help safegaurd their population in the wild.
Warning : Most Ayurvedic medicines are made by combining several different plant ingredients in carefully measured proportions. Therefore self-medication is not advisable.
औषधी गुणधर्म वनस्पतींच्या नाशास कारणीभूत
ज्या वनस्पती आपला जीव वाचवतात त्यांना माणूस समूळ नष्ट करतो हे अत्यंत दुर्दैवी आहे. रानातील स्थानिक औषधी वनस्पती त्यांच्या अतिरेकी वापरामुळे नष्ट होत आहेत. उदा. कळलावी/वाघनखी पूर्वी आपल्या रानातून सहज दिसत असे. पण परंपरागत चालत आलेल्या औषधी वापरामुळे आता क्वचितच नजरेस पडते. यातील औषधी तत्वे कर्करोगावरील उपचारांकरीता तसेच संशोधनाकरीता काढली जातात. मर्यादित वापर व पुनःलागवड केली तरच रानातील यांची संख्या वाढेल.
इशारा : वेगवेगळ्या वनस्पतींचे भाग योग्य प्रमाणात घालून आयुर्वेदिक औषधे बनवली जातात. त्यामुळे स्वतः औषध बनवून ते घेणे हिताचे नाही.


Bird Calls and Songs
Birds use calls to communicate with each other.
Each bird has a unique call. The male and female calls differ. Calls also vary as per their purpose.
Young birds emit begging calls when hungry and juvenile location calls when separated from parents.
Adult birds use social contact calls when feeding in flocks;
flight calls for flight co-ordination; alarm calls when threatened,
mobbing calls when being attacked and agonistic calls when fighting.
During mating, males give out a high-pitched copulatory call while females have a squeaky solicitation call.
Crested Serpent-Eagle
An agile hunting bird, feeds on small animals.
तुरेवाला सर्पगरुड
छोट्या प्राण्यांची शिकार करणारा एक चपळ शिकारी पक्षी.
Racket-tailed Drongo
A noisy forest bird who can mimic many bird calls.
शेपटीवाला कोतवाल
गोंगाट करणारा जंगलातील पक्षी. हा अनेक पक्ष्यांच्या उत्तम नकला करतो.
Spotted Dove
A unique bird with chessboard pattern on its neck.
फरुका
याच्या मानेवर बुद्धीबळाच्या पटासारखी पिसांची रचना असते.
Common Tailorbird
Stitches its own leafy nest.
शिंपी
पानांचे घरटे शिवतो.
Common Iora
Clings to twigs sideways or upside down in search of insects.
चुमग
फांदीला उलटा लोंबकळून कीटक शोधतो.
Green Bee-eater
Performs aerial acrobatics when snapping up insects in flight.
वेडा राघू
उडतो कीटक पकडताना हवेत अनेक सुंदर कसरती करतो.


पक्षांचे आवाज आणि गाणी
एकमेकांशी संवाद साधण्यासाठी पक्षी आवाजाचा उपयोग करतात.
प्रत्येक पक्ष्याचा विशिष्ट असा आवाज असतो. नर व मादी यांचे आवाज वेगळे असतात. विशिष्ट कारणाकरिता त्यांच्या आवाजात फेरबदल होतो.
लहान पिल्ले भूकेलेली असताना याचनेचा आवाज करतात तर मोठी पिल्ले आपल्या आईवडिलांपासून वेगळे झाल्यास आपले स्थान दर्शविण्यासाठी हाका मारतात.
पक्षी थव्याने एकत्र चरताना सामूहिक आवाज करतात.
उड्डाण समन्वयासाठी वेगळे आवाज, धोका वाढल्यास धोक्याची सूचना देणारा आवाज,
हल्ला झाल्यास चोळक्याने आवाज तर युद्ध परिस्थितीत वेदनामय आवाज देतात.
मीलनकाळात नर मीलनासाठी साद घालतो तर मादी तीक्ष्ण आवाजात प्रतिसाद देते.
Oriental Magpie Robin
Familiar songster in towns and cities.
दयाळ
शहरातील, नागरी वस्तीतील ओळखीचा पक्षी.
Spotted Babbler
Shy bird; rummages on the ground in groups for insects.
ठिपक्यांचा सातभाई
लाजरा पक्षी. जमिनीवरील कीटक हे पक्षी समुहाने एकत्रित ढुंढाळतात.
White-rumped Shama
Shy forest bird and the best songster among Indian birds
शामा
जंगलातील लाजरा बुजरा पक्षी. भारतीय पक्ष्यांमध्ये सर्वात सुंदर गाणारा पक्षी आहे.
Red-whiskered Bulbul
Vivacious bird with a pointed crest; prefers forests
शिपाई बुलबुल
डोक्यावर टोकदार तुरा असलेला, जंगलात राहणारा एक आनंदी पक्षी.
Purple Sunbird
A small restless bird which feed on flower nectar.
जांभळा शिंजीर
फूलातील मधुरसावर गुजराण करणारा अत्यंत चळवळ्या छोटूकला पक्षी.
Coppersmith Barbet
Excavates in a dead or decaying tree to make a hole and nest in it.
तांबट
मेलेल्या किंवा कुजलेल्या झाडामध्ये ढोली तयार करुन त्यात राहतो.

II. INSTALATIONS IN AND AROUND CEC

A. NATURE TRAIL SIGNAGE

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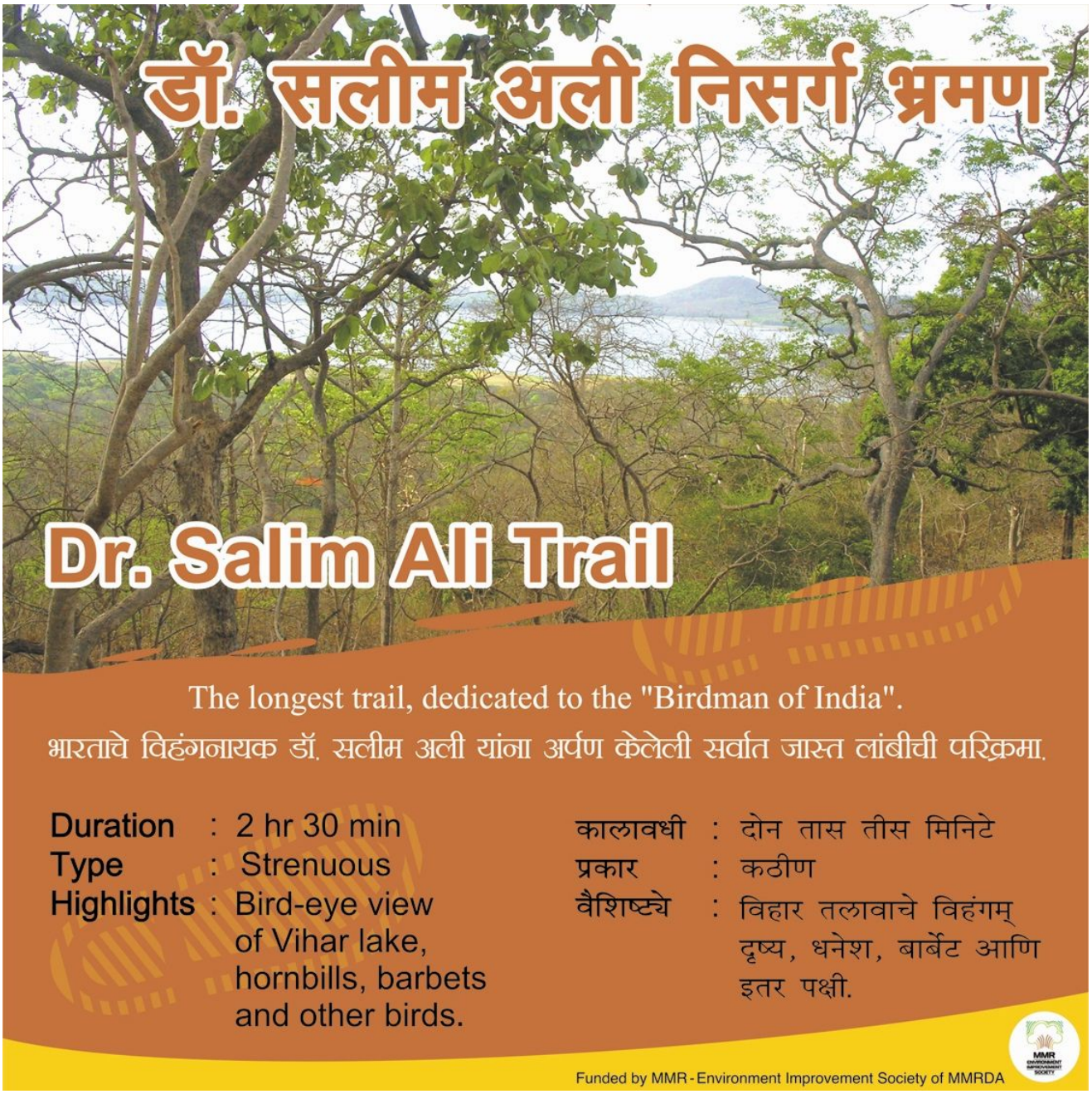

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Beware! You are venturing into the territory of the King of this Jungle, the Leopard!

सावधान! तुम्ही या जंगलाच्या राजाच्या, बिबट्याच्या साम्राज्यात प्रवेश करीत आहात.

Duration	: 1 hr 30 min	कालावधी	: एक तास तीस मिनिटे
Type	: Strenuous	प्रकार	: कठीण
Highlights	: Butterflies, Ghost Tree, Snakes, Raptors, Hanuman Langurs.	वैशिष्ट्ये	: फुलपाखरे, करई, साप, शिकारी पक्षी, हनुमान लंगूर.

Funded by MMR - Environment Improvement Society of MMRDA

B. BUTTERFLY CHAIR

C. GREEN DEEDS GAME

E. MARINE OSERVATORY TANK DISPLAY

Treasures of the Sea

Marine ecosystems are a part of the largest aquatic system on the planet, covering over 70% of the Earth's surface. Some examples of important marine ecosystems are:

Oceans Estuaries Coral Reefs Coastal areas

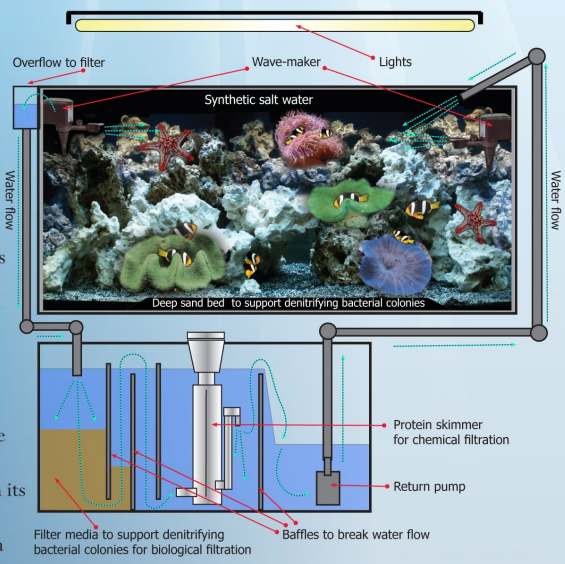
These are home to a host of different species ranging from tiny microscopic organisms, like plankton, to large mammals like whales, manatees and seals. This marine aquarium is a small example of a marine ecosystem and its life forms.

- Clownfish are found in the warm waters of the Indian and Pacific oceans, including the Great Barrier Reef and the Red Sea where they live in small groups inhabiting a single anemone.
- Depending on the species, clownfish can lay hundreds or thousands of eggs on flat surfaces near the anemone.

Did you know?

Although all clownfish are born male, they are later able to change their sex to female!

- Sea anemones spend most of their lives in one place; some have the ability to move, but can only travel three to four inches an hour.
- The sea anemone captures its prey, like small fish and shrimp, with its deadly stinging tentacles.
- Sea anemones reproduce by budding off baby sea anemones, which stay connected to the adult until old enough to go out on their own.



Did you know?

If a sea anemone is torn apart by rocks, then each part becomes a new sea anemone!


Green Carpet Anemone with Clownfish

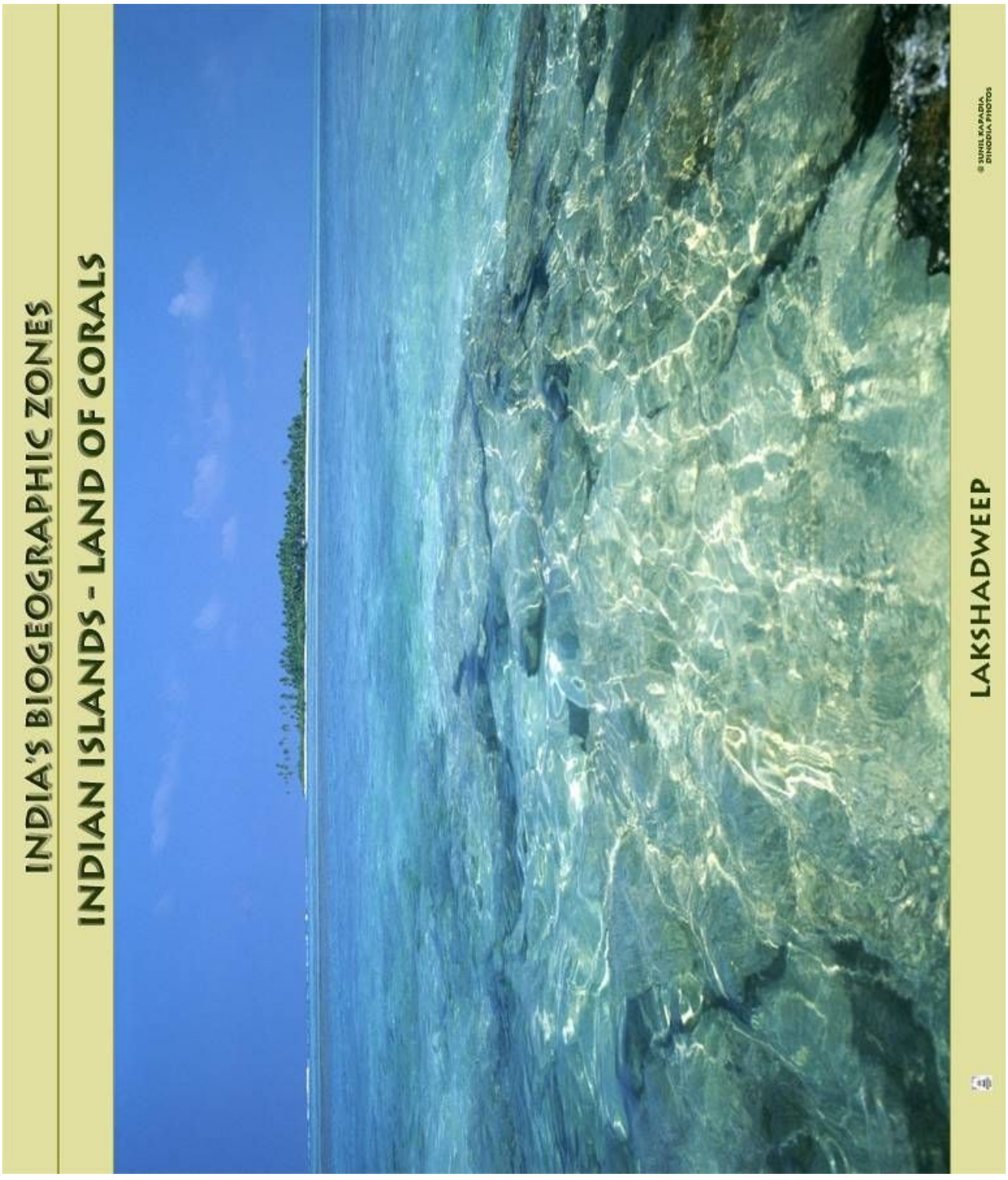
A friendship as deep as the ocean…

- The clownfish feeds on undigested food which could otherwise harm the sea anemone, and the faecal matter from the clownfish provides nutrients to the sea anemone.
- The sea anemone also provides safety to the clownfish as its venom keeps other creatures away.
- Clownfish are one of the few fishes that can avoid the poison of a sea anemone. This is probably due to a special mucus coating that is unpleasant to the sea anemones.
- It is also suggested that over years of evolving together, clownfish have developed an immunity to the stingers of the anemones.

Marine habitats provide us with a rich source of food and income and support species that serve as animal feed, fertilizers for crops, additives in foods and cosmetics. Areas such as mangroves also provide protection to coastlines by reducing wave action and helping to prevent erosion. Despite the importance of marine ecosystems, increased human activities such as overfishing, coastal development, pollution and the introduction of exotic species have caused significant damage and pose a serious threat to marine biodiversity.

F. AMPHIBIAN OBSERVATORY POND

[G] NATURE PORTRAITS



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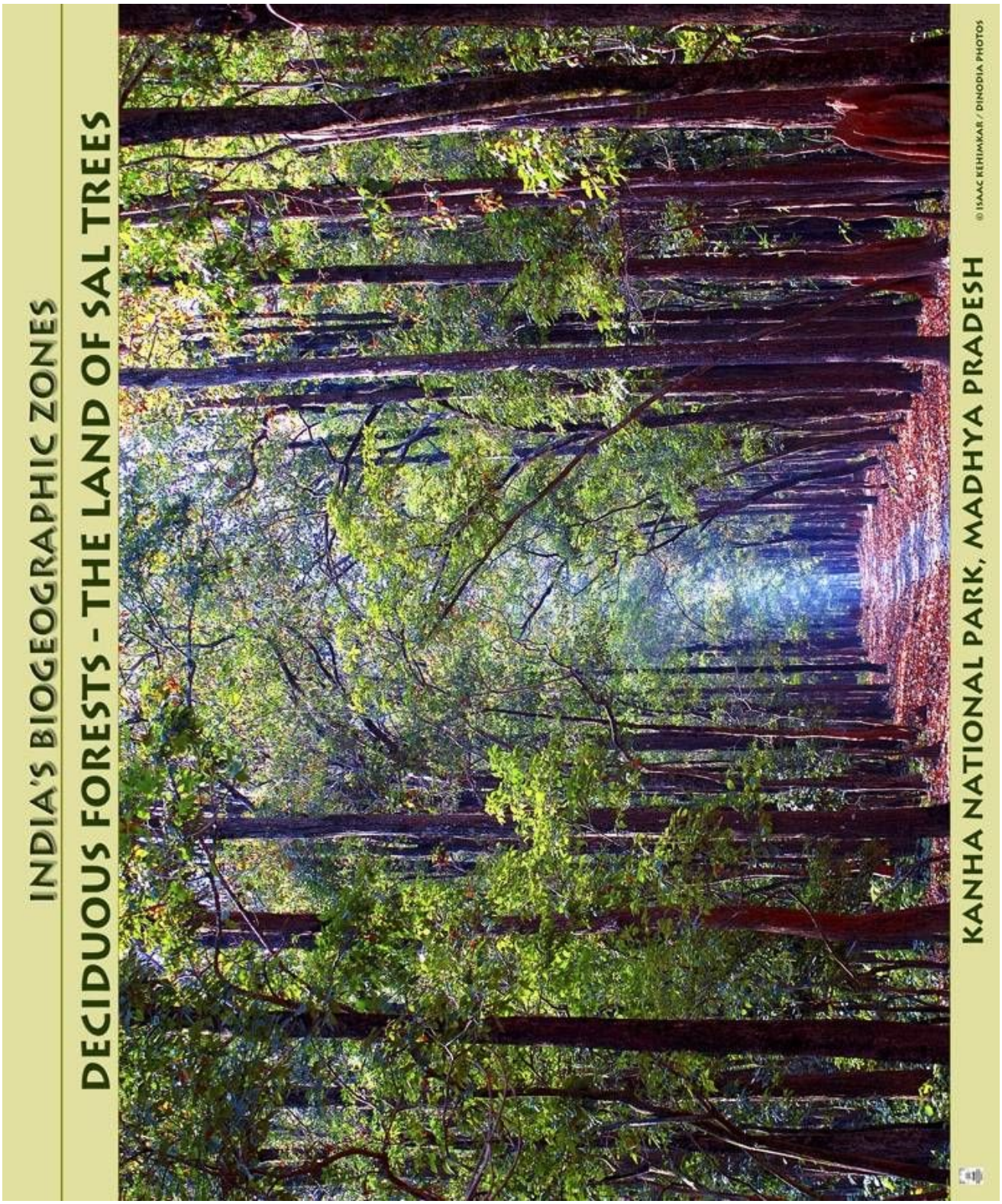
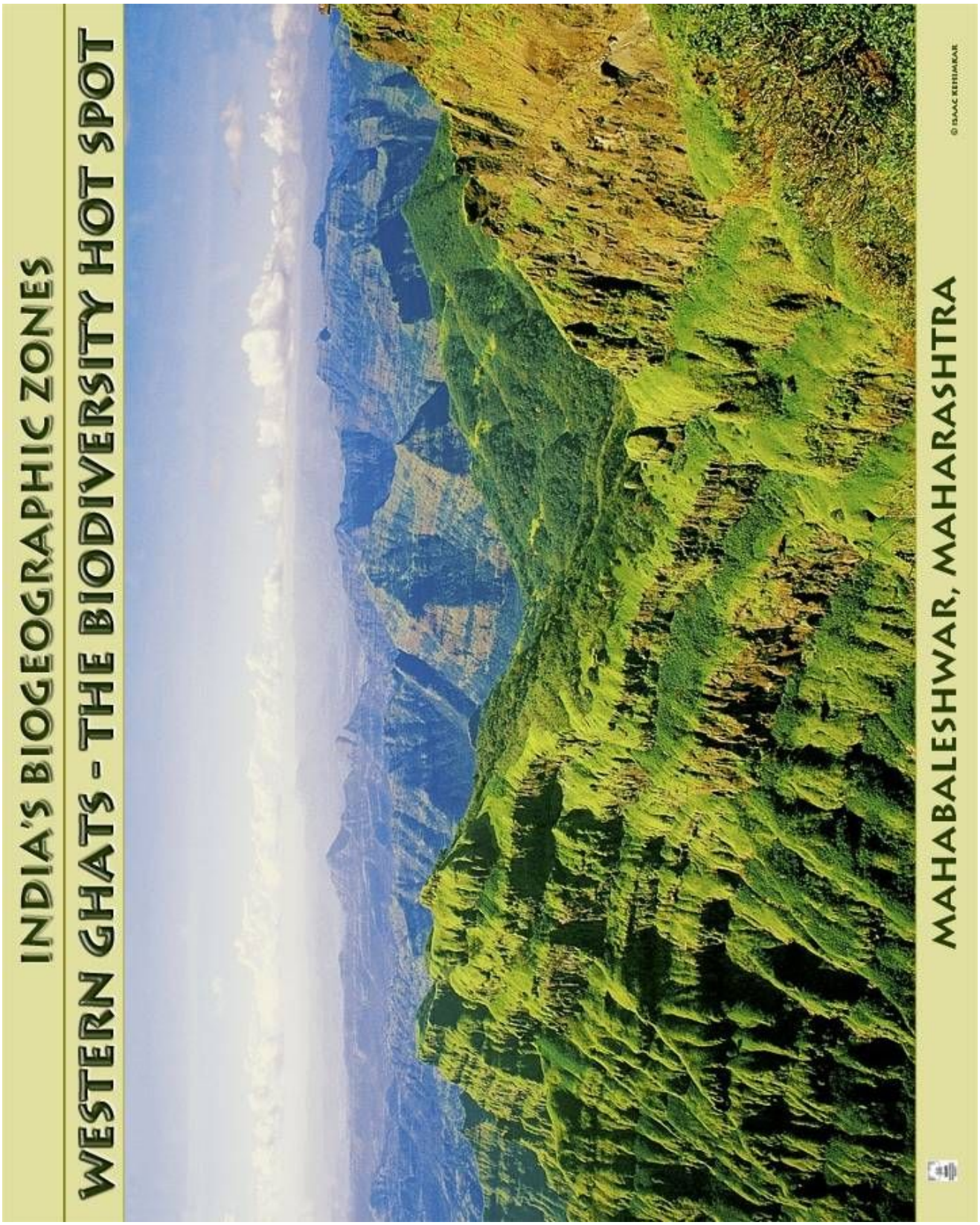
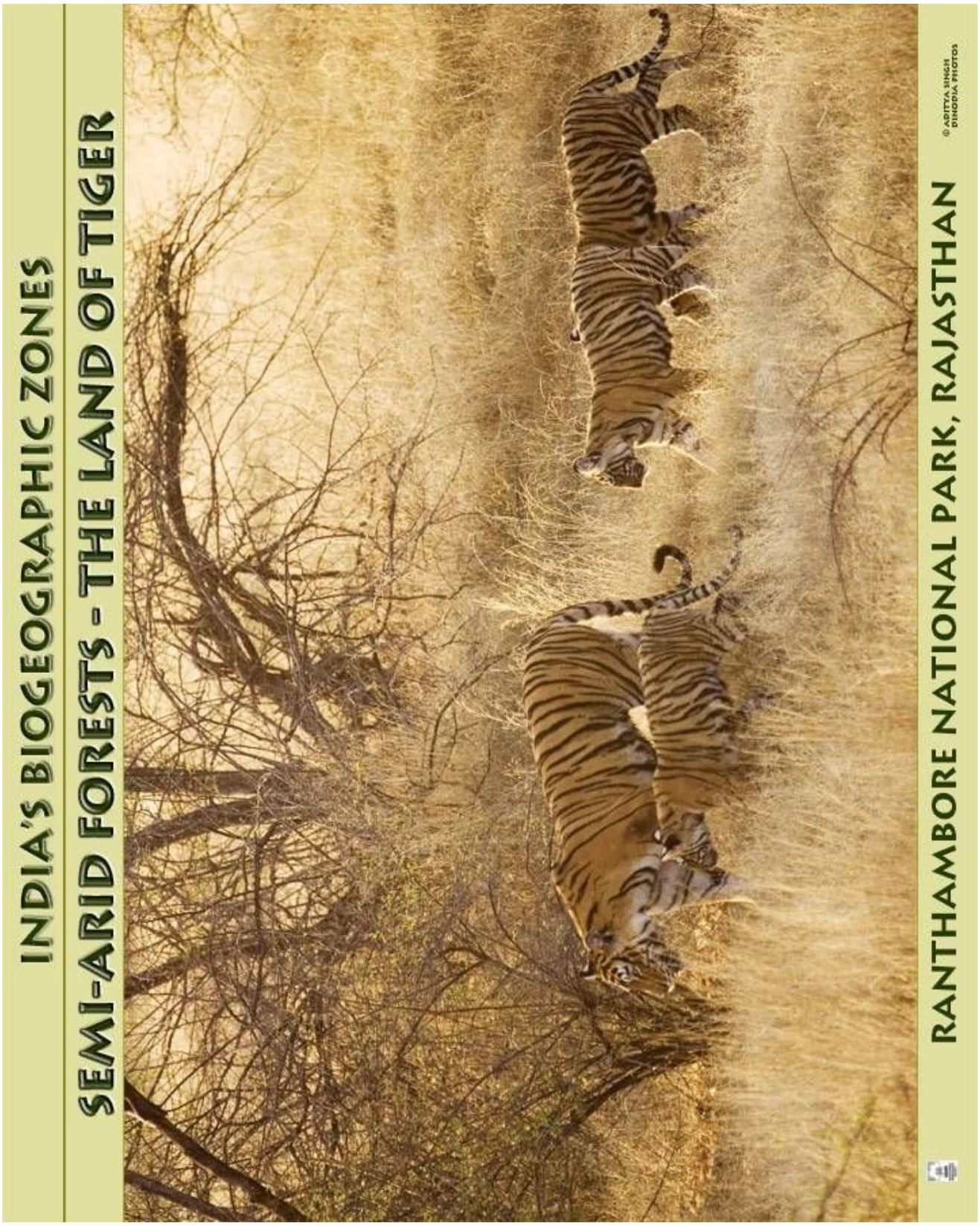
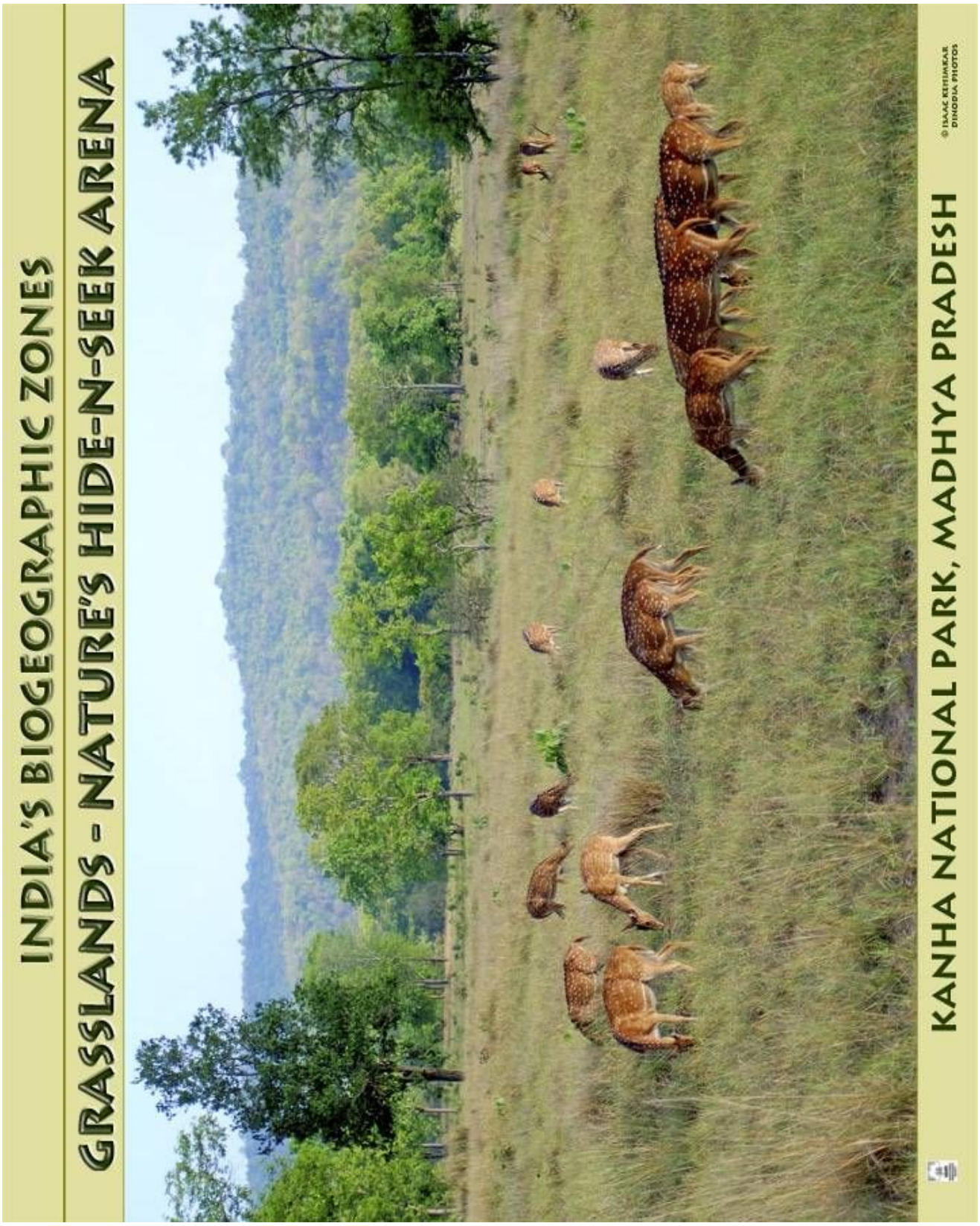
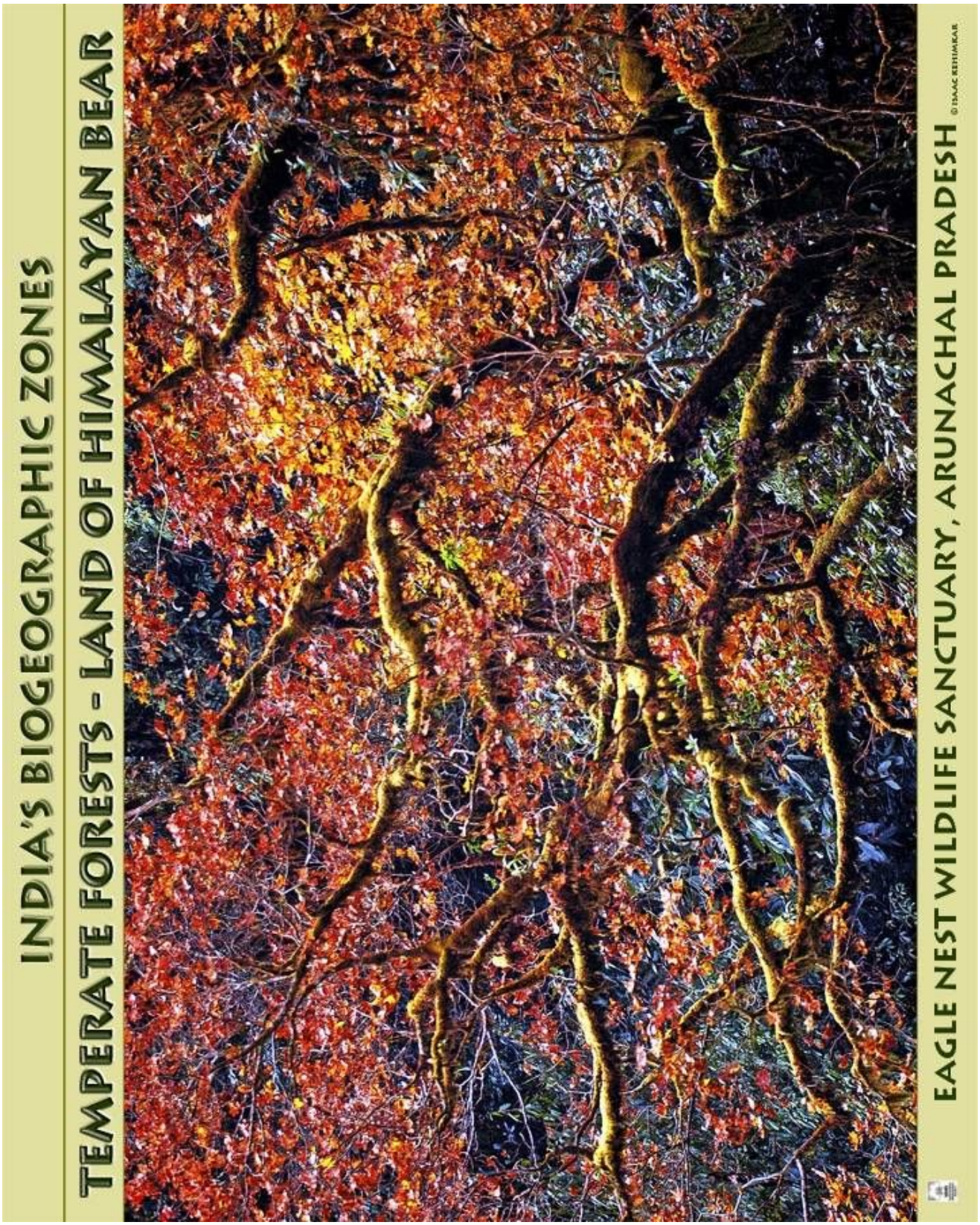


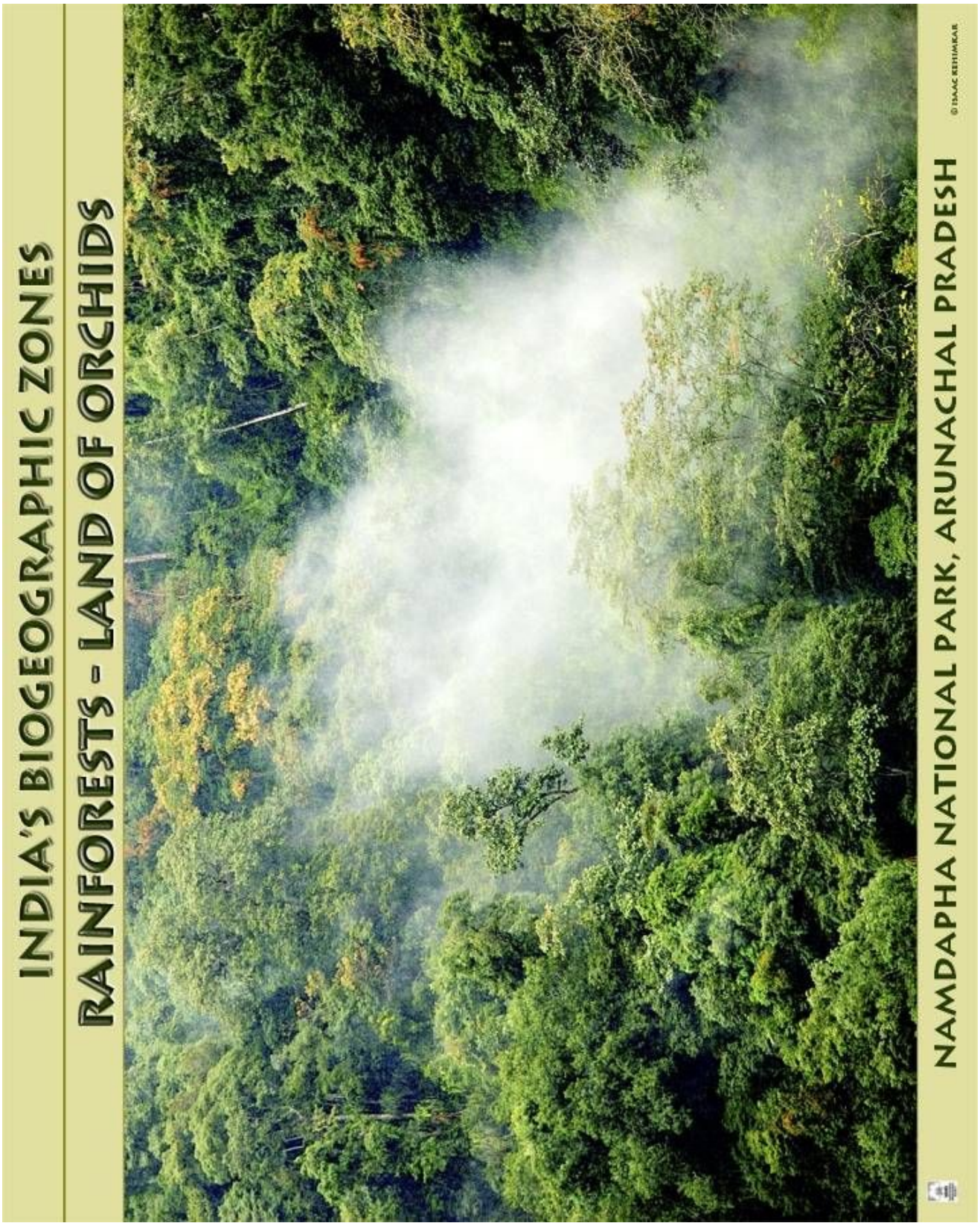

INDIA'S BIOGEOGRAPHIC ZONES
WESTERN GHATS - THE BIODIVERSITY HOT SPOT
MAHABALESHWAR, MAHARASHTRA

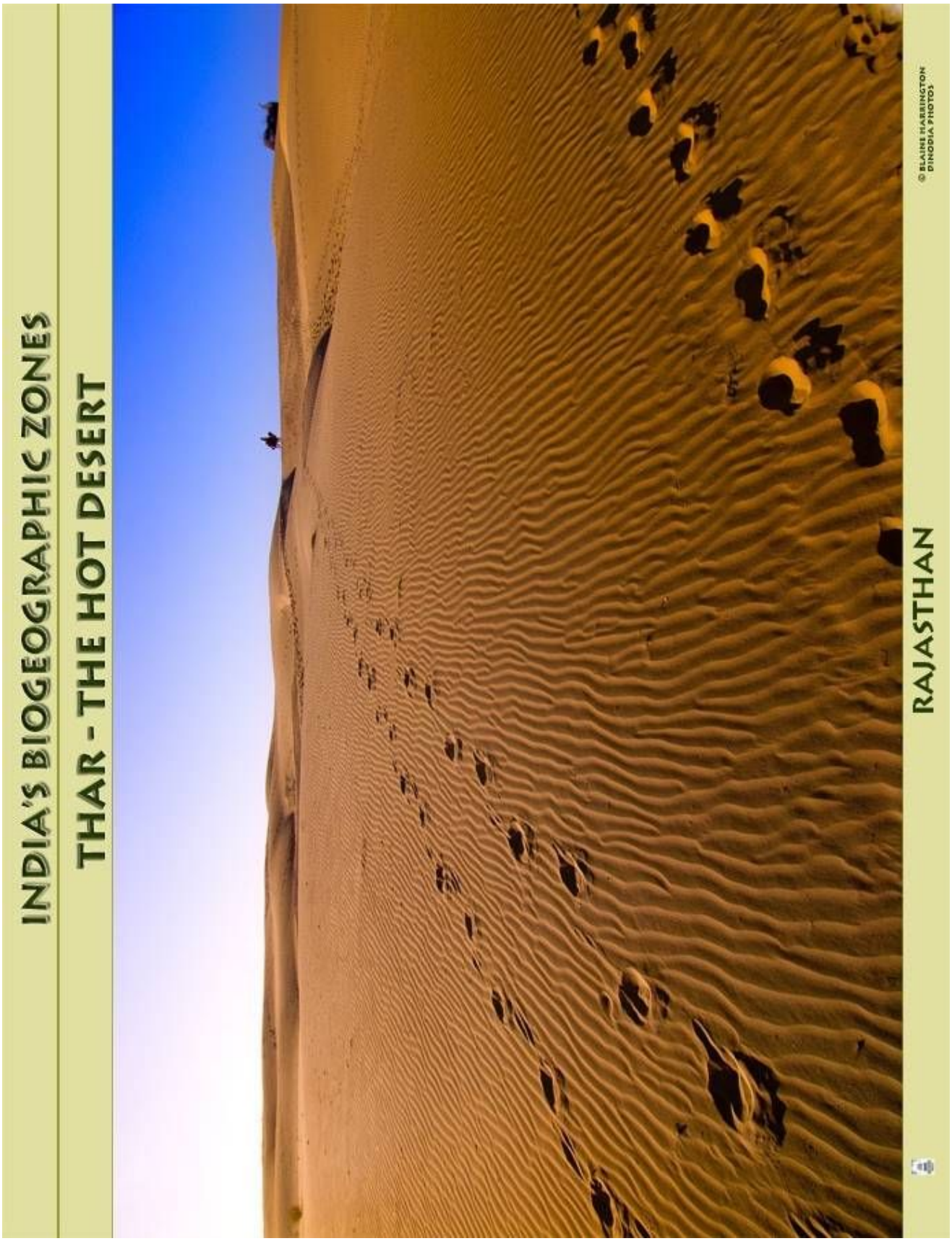

INDIA'S BIOGEOGRAPHIC ZONES
SEMI-ARID FORESTS - THE LAND OF TIGER
RANTHAMBORE NATIONAL PARK, RAJASTHAN
© ADITYA SINGH
DINODIA PHOTOS

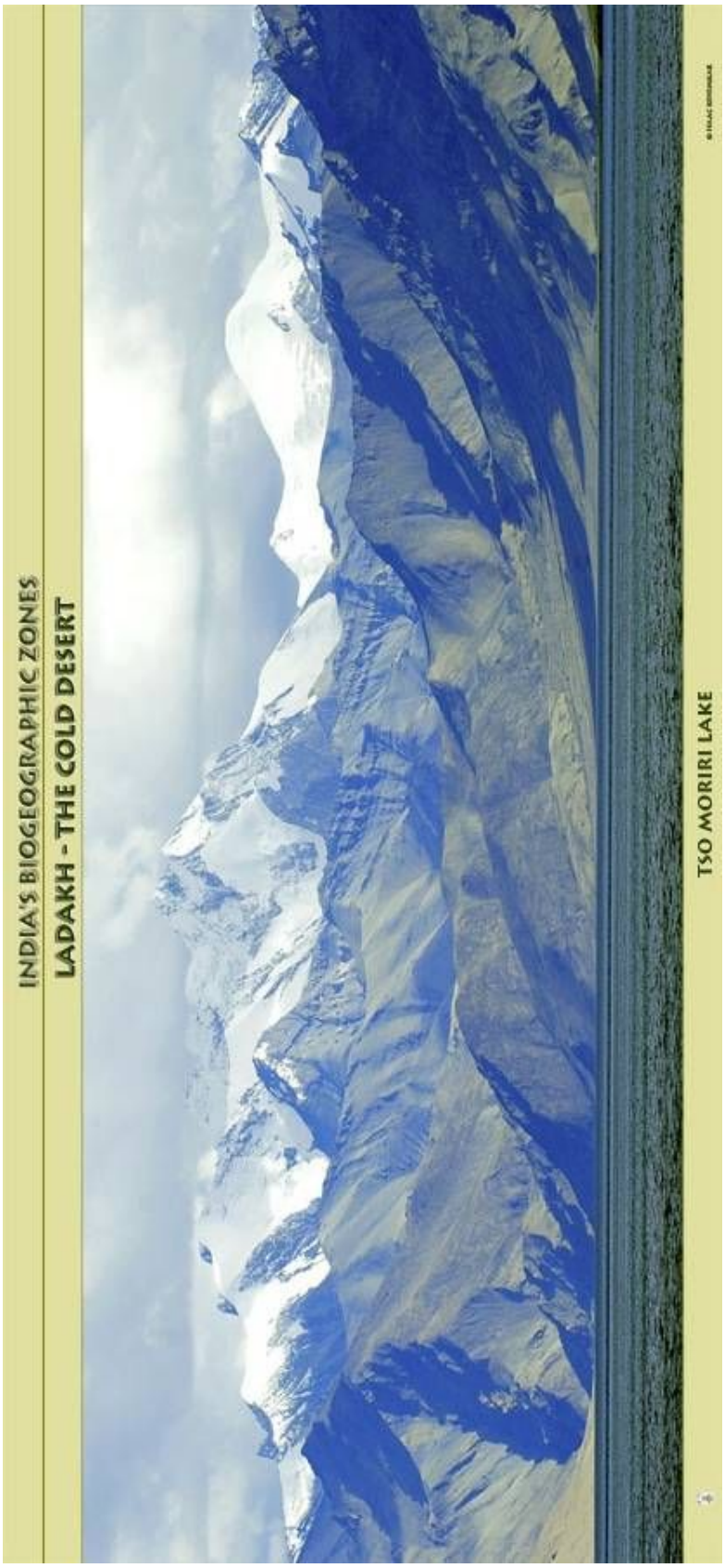

INDIA'S BIOGEOGRAPHIC ZONES
GRASSLANDS - NATURE'S HIDE-N-SEEK ARENA
KANHA NATIONAL PARK, MADHYA PRADESH
© ISAAC KEHIMKAR
DINODIA PHOTOS

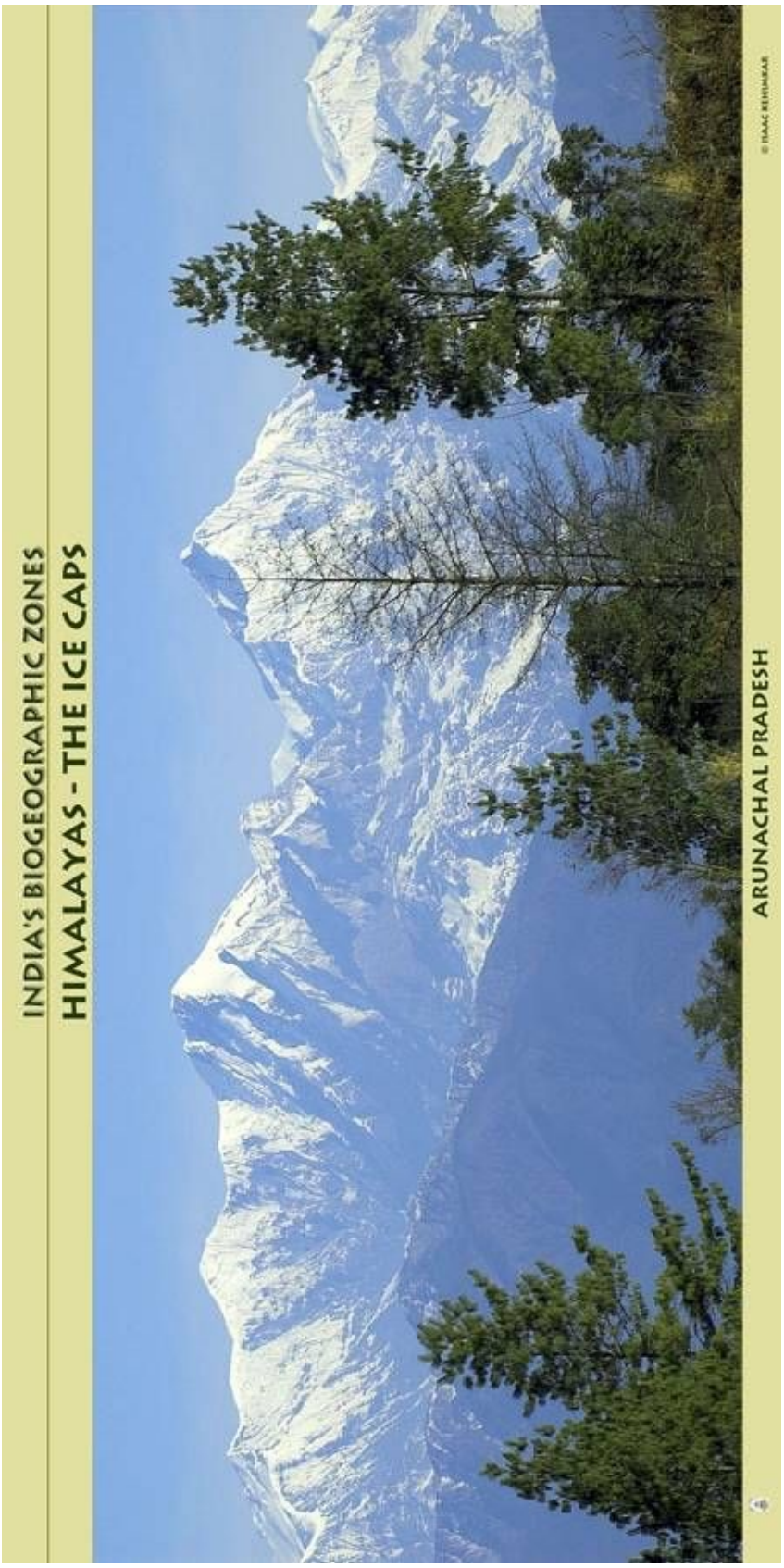
Bombay Natural History Society: Conservation Education Centre




INDIA'S BIOGEOGRAPHIC ZONES
RAINFORESTS - LAND OF ORCHIDS
NAMDAPHA NATIONAL PARK, ARUNACHAL PRADESH


INDIA'S BIOGEOGRAPHIC ZONES
THAR - THE HOT DESERT
RAJASTHAN
© BLAINE HARRINGTON
DINODIA PHOTOS

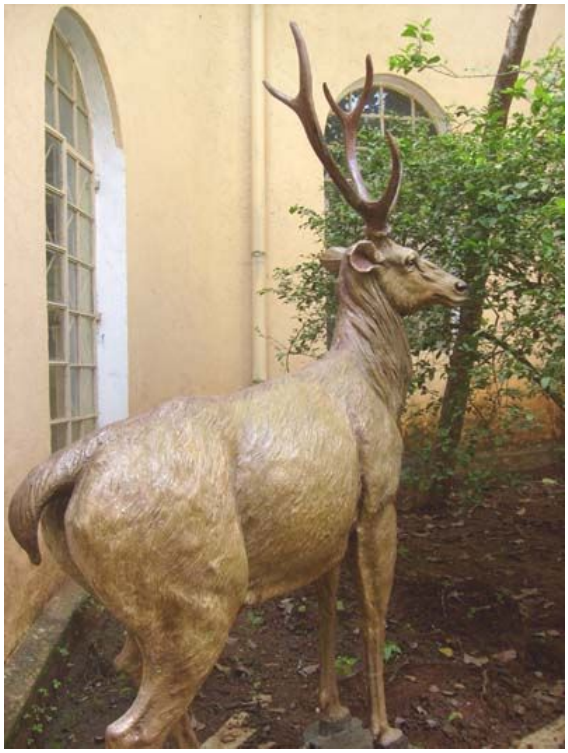

INDIA'S BIOGEOGRAPHIC ZONES
LADAKH - THE COLD DESERT
TSO MORIRI LAKE

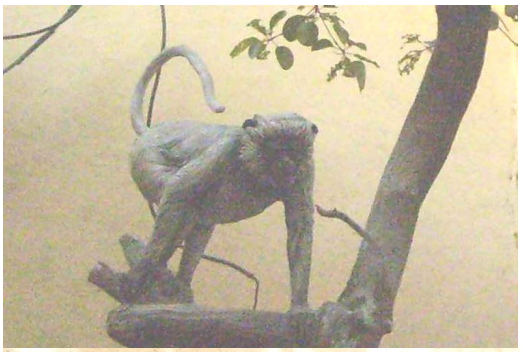

INDIA'S BIOGEOGRAPHIC ZONES
HIMALAYAS - THE ICE CAPS
ARUNACHAL PRADESH

[H] SIGNAGE FOR BUTTERFLY GARDEN

Bombay Natural History Society: Conservation Education Centre

[I] WILDLIFE DIORAMAS

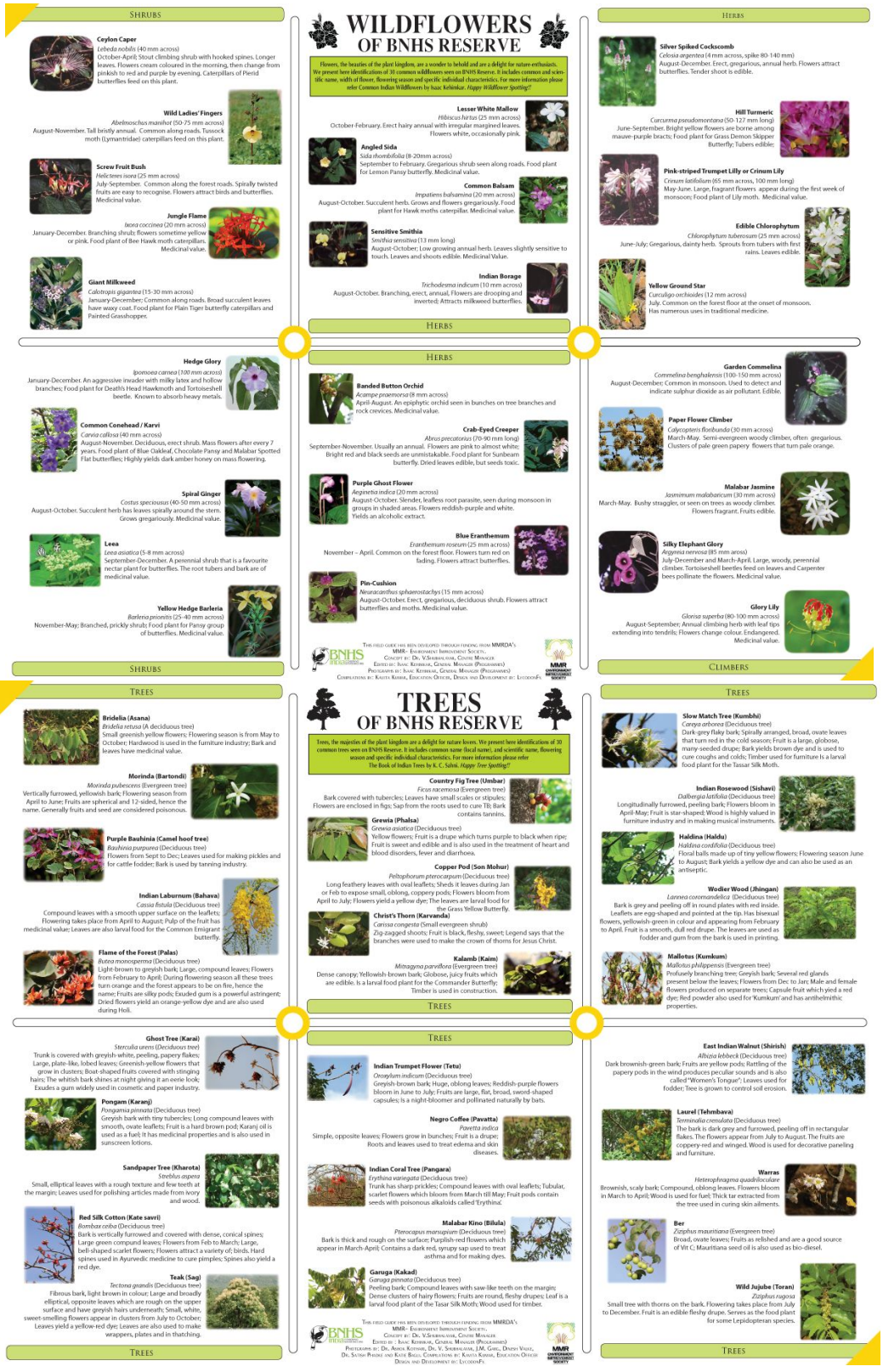




Bombay Natural History Society: Conservation Education Centre

[J] ATLASMOTH MASCOT

III. NATURE FIELD GUIDE




BIRDS
OF BNHS RESERVE
Birds, the feathered songsters of the forest, are a joy to see and a delight to hear. We present here identifications of 54 common birds seen on our Reserve. It includes common and scientific names, season and specific feeding and behavioural traits.
For more information please refer The Book of Indian Birds by Dr. Salim Ali. Happy Bird Watching!
PASSERIFORMES. COLUMBIFORMES
Paradise Flycatcher
Terpsiphone paradisi (20 cm)
A handsome bird with a sharp skreek call often heard in well wooded areas. They make cup-shaped nests and feed exclusively on insects.
Common Tailorbird
Orthotomus sutorius (13 cm)
Common bird seen among bushes searching for insects. Gets its name for nest it stitches leaves together.
Laughing Dove
Streptopelia senegalensis (27 cm)
A slender bird. Often seen in pairs. It's typical call oo-took-took-oo-roo gives it its name. Its diet consists mainly of seeds and grain.
Spotted Dove
Streptopelia chinensis (30 cm)
A familiar bird seen feeding on seeds on roads and open areas. The call is a gentle coo-coo-kroo.
Tickell's Blue Flycatcher
Cyornis tickelliae (14 cm)
An attractive insectivorous bird. Female is greyish-blue in colour.
Chestnut-tailed Starling
Sturnus malabaricus (20 cm)
Flowering trees are the best spots to see this omnivorous bird in small flocks.
Purple Sunbird
Cinnyris asiaticus (10 cm)
Feeds primarily on nectar, occasionally take insects. They make clumsy nests from forest litter.
Purple-rumped Sunbird
Leptocoma zeylonica (10 cm)
Very small and attractive bird, feed largely on nectar, and may feed on insects, especially when feeding young. Female duller
PASSERIFORMES
PASSERIFORMES
Large-billed Crow
Corvus macrorhynchos (46-59 cm)
This all-black, stocky crow is named for its long, thick bill. More common in the forest.
Greater Racket-tailed Drongo
Dicrurus paradiseus (32 cm)
An insectivorous, robust bird. Long tail has two outermost racket shaped feathers extended. Good mimic of other bird calls.
Black Drongo
Dicrurus macrocercus (28 cm)
An insectivorous bird with long, forked tail and a white spot in front of the eye. Mimic calls of other birds.
Common Myna
Acridotheres tristis (25 cm)
An omnivorous noisy bird more common in urban areas. It builds nests in the hollows of trees. It is also known to usurp the nests of other birds by forcefully evicting them or building its nest on top.
PASSERIFORMES
Green Bee-eater
Merops orientalis An acrobatic slender bird. Catches insects in mid air. Seen alike. They dig nest burrows in the ground where they form small colonies or live near other bee-eaters.
White Rumped Shama
Copsychus malabaricus (22 cm)
An exclusive forest-dweller, this insectivorous bird is a renowned songster.
White-throated Fantail
Rhipidura albicollis (19 cm)
An unmistakable bird with its tail fanned out as it chases insects. Call melodious.
Yellow Wagtail
Motacilla flava (18 cm)
A slender bird, often seen walking along the water's edge in search of insects. As its name suggests, it wags its tail from time to time.
Orange-headed Thrush
Zoothera citrina (21 cm)
A melodious songster more often seen on the ground, and among undergrowth.
PASSERIFORMES
Oriental Magpie Robin
Copsychus saularis (23 cm)
This insectivorous bird is a common resident. Male is a prolific songster. Female dull greyish.
Indian Robin
Saxicoloides fulicatus (19 cm)
Seen hopping with tail held upright in open drier areas. A common insectivorous bird. Its nests are pads of grass, feather and fur made in holes in trees or earth banks.
Black-hooded Oriole
Oriolus xanthornus (25 cm)
Female has greenish underparts. Juvenile is black-streaked with white throat and yellow breast. Feeds on insects and fruits Build suspended nests of grass, leaves and twigs, lined with soft fur or feathers.
Eurasian Golden Oriole
Oriolus oriolus (25 cm)
Golden-yellow male is unmistakable. Summer visitor. Its nest is a beautifully woven deep cup of grass and fibres bound with cobweb, suspended like a hammock. Melodious call.
PASSERIFORMES
Baya Weaver
Ploceus philippinus (15 cm)
Known for its unique nest weaving ability. Both sexes look like sparrows in non-breeding season. They nest in colonies of 20-30. Nests hang from a branch and are shaped like upside down flasks.
Common Iora
Aegithina tiphia (14 cm)
A common insectivorous bird. It bulls deep, cup-shaped nests in the fork of branch. It has a very distinctive we-e-e-e-tu call.
Tickell's Flowerpecker
Diaceum erythrorynchos (8 cm)
It is the smallest among Indian birds. It feeds on berries and nectar. Easy to spot the bird by its loud chik-chik call.
Red-vented Bulbul
Pycnonotus cafer (20 cm)
Familiar bird of the forest and gardens. Feeds on fruits, nectar and insects. Melodious call.
Red-whiskered Bulbul
Pycnonotus jocosus (20 cm)
Red 'cheeks' are typical of this bird. Feeds on fruit, nectar and insects. Call melodious.
PASSERIFORMES
PASSERIFORMES
Long-tailed Shrike
Lanius schach (25 cm)
Smallest of the grey shrikes, feeds on large insects, lizards, small rodents and birds. It is known to impale its prey on sharp thorns, for ease in feeding, as its feet are unsuitable for tearing.
Rufous Treepie
Dendrocitta vagabunda (46-50 cm)
A member of the Crow family, it feeds on fruits, insects, small reptiles, eggs and young of birds. Easy to locate by its typical harsh call.
Dusky Crag-Martin
Hirundo concolor (13 cm)
Spends most of time flying, feeding on winged insects in the air. The nest is made of mud and usually located beneath the protective overhang of a rocky cliff.
Jungle Babbler
Turdoides striata (25 cm)
Gregarious noisy birds seen in small groups of six to ten birds, a habit that has given them the popular name of Seven Sisters or Saath bhai.
Puff-throated Babbler
Pellorneum ruficeps (15 cm)
Insectivorous bird that builds nests on the ground amongst bamboo or scrub thickets. Its melodious whistle makes it easy to locate the bird.
PICIFORMES
Coppersmith Barbet
Megalaima haemacephala (17 cm)
The loud, metallic tunk…tunk…tunk makes it easy to locate this small green bird. Feeds on fruits and berries.
Brown-headed Barbet or Large Green Barbet
Megalaima zeylanica (27 cm)
The sexes are similar. Feeds on fruits and insects and nests in tree holes.
Yellow-crowned Woodpecker
Dendrocopos mahrattensis (17-18 cm)
Feeds on insects. Female has yellowish crown and nape. They nest in holes in trees.
Rufous Woodpecker
Celeus brachyurus (25 cm)
This woodpecker is known for its strange adaptation of raising its young in the Crematogaster ants' nest. The woodpecker also feeds on those ants.
Black-rumped Flameback
Dinopium benghalense (26-29 cm)
Male has a red crown and crest while females have a black fore-crown spotted with white. While feeding, the woodpecker's long tongue darts forward to pick out hiding insects.
CORACIIFORMES
Common Kingfisher
Alcedo atthis (16 m)
An attractive small bird seen along ponds, lakes and stream. Feeds mainly on fish and small aquatic animals.
Indian Grey Hornbill
Ocyceros birostris (50 cm)
Unmistakable large bird with large bill. Female has a smaller bill. Feeds mainly on fruits and insects. Known for its unique nesting habit, where the female is sealed in a hole in the tree with only her beak poking out so that the male may feed her.
White-throated Kingfisher
Halcyon smyrnensis (28 cm)
Familiar bird along ponds and streams as well as inside the forest. Feeds on insects, crustaceans, earthworms, snakes, frogs and fish.
Common Hoopoe
Upupa epops (31 cm)
Mostly seen on open grassy ground probing for grubs, small insects and berries. Seen mainly as winter visitor.
PSITTACIFORMES. APODIFORMES. GALLIFORMES
Grey Jungle Fowl
Gallus sonneratii (70-80 cm)
A graceful bird, the male along with females are seen foraging in the undergrowth for seeds, shoots, tubers, berries and insects.
Jungle Bush Quail
Perdicula asiatica (17 cm)
Shy birds, remain among the grass and undergrowth. Feeds primarily on grass seeds and sometimes on insects.
Indian Peafowl
Pavo cristatus (180-230 cm)
The National Bird of India is more often heard than seen in this area, mainly during the rains. Feeds on fruits, seeds, insects and small reptiles.
Rose-ringed Parakeet
Psittacula krameri (42 cm)
A noisy bird. Neck rings are absent in the female. Feeds on fruits, nuts, berries and seeds and nests in trees.
Asian Palm Swift
Cypsiurus balasiensis (13 cm)
An agile bird that spends most of its life in the air. Feeds on insects caught while flying. It has characteristic swept-back wings, resembling a crescent or boomerang.
CUCULIFORMES. ACCIPITRIFORMES
Crow Pheasant or Greater Coucal
Centropus sinensis (48 cm)
Known for its whooping call this large cuckoo prefers to walk while foraging for insects, bird eggs, lizards and berries. This is the only nest-building cuckoo.
Asian Koel
Eudynamys scolopacea (43 cm)
Is a fruit eater, but may feed on insects and bird eggs. A known brood parasite of crows and drongos. Known for its melodious call.
Pied Crested Cuckoo
Clamator jacobinus (33 cm)
Known as the harbinger of rains, this insectivorous birds migrates here from the south. It is a brood parasite chiefly on babblers.
Common Hawk Cuckoo
Cuculus varius (34 cm)
Resembles the Sparrowhawk. Feeds on insects and berries. It is a brood parasite.
Oriental Honey-Buzzard
Pernis ptilorhyncus (57-60 cm)
Unlike other raptors, it has smaller pigeon-like head. Feeds mainly on bee and wasp larvae, but also hunts small birds, reptiles, frogs and insects.
FALCONIFORMES. STRIGIFORMES
Black Kite
Milvus migrans (55-68.5 cm)
Seen more in degraded open areas. Hovers in the sky as it hunts rodents, lizards, snakes and fish. A resident and winter visitor.
Crested Serpent Eagle
Spilornis cheela (56-74 cm)
Easy to recognize by its call as it circles in the sky. Feeds on snakes, lizards, rodents and insects too.
Common Shikra
Accipiter badius (30-36 cm)
Sexes alike, but female larger. Feeds on lizards, dragonflies, small birds and mammals.
Common Kestrel
Falco tinnunculus (32-35 cm)
Hovers in the sky while hunting for mice, lizards and insects. A resident as well as local winter visitor.
Jungle Owlet
Glaucidium radiatum (20 cm)
This small owlet is more often seen and heard during the day. Hunts insects, rodents, lizards and snakes.


BUTTERFLIES
OF BNHS RESERVE
Butterflies, the ambassadors of the insect world are an eye-catcher for every nature enthusiast. We present here identifications of 60 common butterflies seen on our reserve. It includes common and scientific names, wingspan and specific behavioural traits.
For more information please refer The Book of Indian Butterflies by Isaac Kehimkar. Happy Butterfly watching!
PAPILIONIDAE: SWALLOWTAILS
Spot Swordtail
Graphium nomius (75-90 mm)
More common in the summer and winter months. Among the swallowtails of this forest, this butterfly has the longest tail.
Blue Mormon
Papilio polymnestor (120-150 mm)
Largest butterfly among the butterflies found here. Hind wing tailless. Common during and after the rains.
Common Rose
Atrophaneura aristolochiae (80-110 mm)
A distasteful, red-bodied swallowtail mimicked by female Common Mormon. Known to migrate locally.
Crimson Rose
Atrophaneura hector (90-110 mm)
Second red-bodied swallowtail, not as commonly seen as Common Rose. Visits as migrant after monsoon. Mimicked by female Common Mormon.
Common Bluebottle
Graphium sarpedon (80-90mm)
This swift flier resembles Common Jay, but has a single row of bright greenish-blue spots on the dark wings.
HESPERIIDAE: SKIPPERS
Conjoined Swift
Pelopidas conjuncta (45-52 mm)
Large brown skipper with transparent yellow spots on wings. Seen during the rains in the forest.
Indian Palm Bob
Suastus gremius (32-45 mm)
Common where its food plants, mainly ornamental palms are grown. Black spots on underside of wings.
Grass Demon
Udaspes folus (40-48mm)
Black and white skipper. Flight fast, erratic. Abundant during rains when Hill Turmeric, its favourite foodplant is abundant.
Orange Awlet
Bibasis jaina (60-70 mm)
Orange streaks on pale brown underside of wings. Hind wing has orange fringe. Active during early morning and evening.
Chestnut Bob
Iambrix salsala (26-30 mm)
Forest skipper with a dodging, fast flight close to the ground. Comes to flowers and animal droppings.
PIERIDAE: WHITES & YELLOWS
Yellow Orange Tip
Ixias pyrene (50-70 mm)
Seen in forest almost throughout the year. Female is paler with no orange patch.
White Orange Tip
Ixias marianne (50-55 mm)
Prefers forested areas. Female has four black spots on the orange patch.
Great Orange Tip
Hebomoia glaucippe (80-100 mm)
Largest among Indian Pierids. Female has additional row of spots on upperside of hind wing.
Common Grass Yellow
Eurema hecabe (40-50 mm)
Commonest butterfly in the forest in all seasons. Colour varies seasonally.
Common Emigrant
Catopsilia pomona (55-80 mm)
Common butterfly, seen along the roads where its caterpillars feed on Cassia trees. Their colour varies from yellow to translucent greenish white. Known to migrate.
PAPILIONIDAE: SWALLOWTAILS
Common Mormon ♀
Common Mormon ♂
Papilio polytes (90-100 mm)
Commonest among the Swallowtails. Male is not similar to the female, which mimics distasteful Common Rose and Crimson Rose butterflies.
Lime butterfly
Papilio demoleus (80-100 mm)
Common where lime and lemon trees grow, on which it lays eggs. Hind- wing is tailless.
Common Jay
Graphium doson (70-80 mm)
Very similar to Common Bluebottle, but is much paler. More common in urban areas.
Tailed Jay
Graphium agamemnon (85-100 mm)
Restless black and green flier, more common in urban areas than in the forest. Female has a longer tail.
Common Mime
Chilasa clytia (90-100 mm)
An interesting butterfly occuring in two colour forms. In clytia form, it looks like Common Crow butterfly while in dissimilis form it mimics Blue Tiger.
HESPERIIDAE: SKIPPERS
Common Redeye
Matapa aria (40-55 mm)
Dwells in bamboo forests and can be seen flying or basking during dawn and dusk. Flight is rapid and likes visiting flowers.
Common Banded Awl
Hasora chromus (45-50 mm)
Frequents stream banks where its food plant, Karanj grows. Narrow white band across the underside of hindwing.
Brown Awl
Badamia exclamationis (50-55 mm)
Flight is extremely rapid and skipping. Rests on the undersides of leaves.
Malabar Spotted Flat
Celaenorrhinus ambareesa (44-55 mm)
Flight swift and erratic. Rests on the underside of rocks and mud banks merging with the background.
Golden Angle
Caprona ransonnetii (35-45 mm)
Unlike typical skippers, Flats and Angles spread their wings flat open. Angular wings are unmistakable.
THIS FIELD GUIDE HAS BEEN DEVELOPED THROUGH FUNDING FROM MMR - ENVIRONMENT IMPROVEMENT SOCIETY.
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EDITED AND PHOTOGRAPHS BY: ISAAC KEHIMKAR.
COMPILATION BY: KAVITA KUMAR. DESIGN AND DEVELOPMENT BY: LUCIDINFO.
PIERIDAE: WHITES & YELLOWS
Common Gull
Cepora nerissa (40-65 mm)
Familiar butterfly of all seasons, both in forest and garden.
Common Wanderer
Pareronia valeria (65-80 mm)
Common butterfly in the forest. Female looks like the Glassy Tiger.
Mottled Emigrant
Catopsilia pyranthe (50-70 mm)
Similar to Common Emigrant, but paler and has fine brown or green lines. Seen on open roads. Known to migrate.
Common Jezebel
Delias eucharis (66-83 mm)
Distinct colour pattern makes it easy to recognize this butterfly. Gaudy colours warn predators to keep off.
Psyche
Leptosia nina (35-50 mm)
Flapping slow flight never rising above knee level is very typical of this dainty butterfly.
LYCAENIDAE: BLUES
Gram Blue
Euchrysops cnejus (25-33 mm)
Common around low bushes of wild legumes. Prefers open dry areas.
Common cerulean
Jamides celeno (27-40 mm)
Weak, fluttering low flight around bushes. Colour pattern varies in dry season.
Monkey Puzzle
Rathinda amor (26-28 mm)
Weak flight. Often seen near Ixora, its food plant. Hind wing has three tails.
Pea Blue
Lampides boeticus (24-36 mm)
Flies close to the ground. Pale reddish lines on white underside. A regular migrant.
Eastern Grass Jewel
Chilades putli (15-22 mm)
Fluttering flight, close to the ground. Prefers open dry areas. It is the smallest butterfly in the Indian region.
NYMPHALIDAE: BRUSH-FOOTED BUTTERFLIES
Blue Tiger
Tirumala limniace (90-100 mm)
Slow, flapping, at times sailing flight. Migrates with other milkweed butterflies. Distasteful to predators.
Glassy Tiger
Parantica aglea (70-85mm)
Slow, weak flight in forest undergrowth. Often migrates with other Milkweed butterflies. Distasteful to predators.
Striped Tiger
Danaus genutia (72-100 mm)
Flight slow. More common after rains. Migrates with other Milkweed butterflies Distasteful to predators.
Plain Tiger
Danaus chrysippus (70-80 mm)
Seen on open roads. Flight slow sailing, close to the ground. Distasteful to predators.
Commander
Moduza procris (60-75 mm)
Flies swiftly, often gliding over the treetops. Common after rains and during winter.
NYMPHALIDAE: BRUSH-FOOTED BUTTERFLIES
Yellow Pansy
Junonia hierta (45-60 mm)
Bright and pretty, this butterfly prefers sunny open places. Not commonly seen.
Peacock Pansy
Junonia almana (60-65 mm)
More common around freshwater marshes. Eye-spots are typical among pansies.
Grey Pansy
Junonia atlites (55-65 mm)
Flight sailing. More common after rains around freshwater marshes.
Blue Pansy
Junonia orithiya (45-60 tmm)
Prettiest among the butterflies. Flies close to the ground. Active during the hottest part of the day in open areas.
Lemon Pansy
Junonia lemonias (40-60 mm)
Low flight, close to the ground. Commonest among the pansies. On the wing throughout the year.
Chocolate Pansy
Junonia iphita (55-80 mm)
Common throughout the year. Prefers to remain in the forest. Unlike other Pansies, the eyespots on wings are not bold.
LYCAENIDAE: BLUES
Red Pierrot
Talicada nyseus (30-36 mm)
An attractive little butterfly. Usualy seen around its favoured fleshy-leaved food plant, Kalanchoe.
Common Acacia Blue
Surendra quercetorum (30-40 mm)
Often seen on the nectaries of Acacia leaflets, sharing nectar with ants. Females have two tails.
Common Silverline
Spindasis vulcanus (26-34 mm)
Fast flier. Keeps to low bushes. Underside has reddish bands with central silver lines.
Common Pierrot
Castalius rosimon (24-34 mm)
Flies close to the ground. No spots in central area of hind wing on underside.
Common Hedge Blue
Acytolepis puspa (28-35 mm)
Flies close to the ground. White butterfly with small black lines and spots on underside. Common during rains.
NYMPHALIDAE: BRUSH-FOOTED BUTTERFLIES
Common Bushbrown
Mycalesis perseus (38-55 mm)
Jerky, low flight among bushes. One of the eyespots in the middle is not in line with others on the underside of hind wing. No eyespots in dry season.
Common Evening Brown
Melanitis leda (60-80 mm)
Flight jerky, close to the ground among the undergrowth. Active at dusk, attracted to light. Mottled brown with no eyespots in dry season.
Common Indian Crow
Euploea core (85-95 mm)
Commonly seen on forest roads. Weak, sailing flight. Migrates with other Milkweed butterflies.
Common Nawab
Polyura athamas (60-75 mm)
Swift flier. Seen on the forest roads on damp patches, animal droppings and dead land crabs.
Blue Oak leaf
Kallima horsfieldi (85-110 mm)
Rapid, erratic flight. Settles upside down to look like a dry leaf. Classic example of camouflage.
NYMPHALIDAE: BRUSH-FOOTED BUTTERFLIES
Great Eggfly ♀
Great Eggfly ♂
Hypolimnas bolina (70-110 mm)
Seen throughout the year. Female looks like the distateful Common Crow. Male territorial.
Danaid Eggfly ♂
Danaid Eggfly ♀
Hypolimnas misippus (70-85 mm)
More common in open drier areas. Female looks like the distasteful Plain Tiger. Male territorial.
Common Sailer
Neptis hylas (50-60 mm)
Graceful sailing flight with occasional flicking of wings. More common after rains.
Tawny Coster
Acraea violae (50-65 mm)
Slow, fluttering flight. Plays dead when caught and exudes a bad smelling yellowish, oily fluid from glands in leg joints. Distasteful to predators.
Common Leopard
Phalanta phalantha (50-60 mm)
Restless, swift flier. Flies in the forest throughout the year. Abundant before and during rains.


INSECTS OF BNHS RESERVE
Insects are the six-legged wonders of the animal world, and whether you like it or not, this planet belongs to them. We present here identifications of 64 common insects other than butterflies and moths seen on our Reserve. It includes name (common and scientific) and habits. This is the first time ever such guide has been developed. So enjoy and Happy Insect Watching!!
BUGS
Water Scorpion
Laccotrephes sp.
A predaceous aquatic bug with a breathing tube at the rear which is held above water. Superficially resembles a scorpion.
Moth Bug
Ricania sp.
Bugs with colourful wings usually held over like a roof. Adults and nymphs are sap feeders.
Leaf Hopper
Ledra mutica
Appearing to be sluggish, this bug is a powerful jumper. Exudes body liquid in defence.
Squash Bug
Dereterpyx hardwicki
A well-camouflaged bug with head, legs, antennae and abdomen having leaf like projections.
Buffalo Tree Hopper
Leptocentrus taurus
Small bugs with projections on their back. They are 'milked' by ants for sugary secretions.
Pond Skater
Gerris sp.
A long-legged, aquatic predatory bug seen 'skating' over the ponds without breaking the water surface.
TRUE FLIES (DIPTERA)
Orange Fly
Phaonia pallida
A common scavenger fly. Feeds on decaying plant and animal matter.
Green Bottle Fly
Calliphora sp.
A stout, iridescent fly. Feeds and breeds on decaying plant and animal matter.
Tabanid Fly
Tabanus sp.
Large, biting fly seen in moist areas. Females are blood suckers, while males are nectar feeders.
Hover Fly
Syrphus torvus
Seen hovering over flowers for nectar. Good pollinator. Beneficial larvae feed on plant pests such as aphids.
Long-nosed Tabanid
Pangonia longirostris
Large, stout fly with long proboscis. Though feared for its long proboscis, it is a harmless nectar feeder. Seen during rains.
Painted Crane Fly
Psellaphora laeta
Large slender fly with long legs. Seen in wet areas. Larvae feed on roots of crops, hence considered as pests.
ANTS, BEES AND WASPS
Cuckoo Bee
Crocisa ramosa
This small digger bee is a brood parasite of other digger bees. Important pollinator.
Carpenter Bee
Xylocopa auripennis (male)
Largest among the bees, this solitary bee is an efficient pollinator. Drills holes into trees for making it's nest.
Cuckoo Wasp
Stilbum cyanurum
A brood parasitic wasp. Lays egg inside the nests of other solitary wasps. Larva devours stored food and host's egg.
Beetle Hunting Wasp
Elis sp.
A ground nesting solitary wasp. Hunts for beetles and stores them as 'baby food' in her nest.
Yellow Crazy Ant
Anoplolepis gracilipes sp.
An Acacia tree associate ant that collects sugary secretion from the plant's nectaries and in return protects the tree.
Ichneumon Wasp
Pimpla sp.
This agile wasp parasitizes caterpillar's body by laying eggs inside through its needle-like egg-laying tube.
BUGS
Red Cotton Bug
Dysdercus cingulatus
Seen in large numbers during summer feeding on seeds of Red Silk Cotton Tree.
Jewel Bug
Chrysocoris stolli
An iridescent sap sucking shield bug commonly seen in forests during monsoon.
Monsoon Cicada
Platypleura sp.
Noisiest among the forest insects, the male creates the sound by vibrating plates on its chest.
Assasin Bug
Acanthaspis sp.
This predatory bug armed with sharp beak and potent venom hunts small insects.
Stink Bug
Erthesina fullo
Camouflage pattern on this shield bug makes it invisible on tree bark. Gives off bad odour when alarmed.
Man-faced Bug
Catacanthus incarnatus
Large, handsome bug with bright pattern resembling a human face on its back.
DRAGONFLIES (ODONATA)
Common Picturewing
Rhyothemis variegata
A beautiful dragonfly commonly seen fluttering around during the monsoon.
Senegal Golden Dartlet
Ischnura senegalensis
A dainty insect with weak flight seen near streams. Orange faced males are common, but females rare.
Common Clubtail
Ictinogomphus rapax
Largest among the dragonflies, seen patrolling over the streams and ponds. Strong flier, rarely at rest.
Long-legged Marsh Glider
Trithemis pallidinervis
Commonest dragonfly seen around ponds and streams. Markings differ among sexes.
Crimson-tailed Marsh Hawk
Orthetrum pruinosum
Males brightly coloured, yellowish females are dull coloured.
Globe Skimmer
Pantala flavescens
Male brighter, female paler. Found abundantly throughout the world.
This field guide has been developed through funding from MMR- Environment Improvement Society.
Concept and content by: Dr. V. Sreenivasan, Photographs by: V. Sreenivasan, Isaac Kehimkar, Rohidas Zaveri
Design and Development by: Lucidosys
MANTIDS (MANTODEA), ROACHES (DICTYOPTERA), STICK INSECTS (PHASMIDA)
Orchid Mantis
Gongylus gongyloides
Leaf like projections on the body and a slow swaying gait is a perfect camouflage for this predator.
Green Praying Mantis
Hierodula coarctata
A common predatory mantid. Displays colourful hindwings when alarmed.
Forest Cockroach
Phyllodromia sp.
A common nocturnal roach among the leaf litter. Feeds on dead and decaying plant and animal matter
Bark Praying Mantis
Humbertiella indica
Matching bark colour makes this flat mantis invisible on the tree trunk. Known to be territorial.
Stick Insect
Necroscia sp.
As its name suggests, its stick-like body is a perfect camouflage.
Stick Praying Mantis
Schizocephalus biconis
Could be mistaken for a stick insect but the triangular head and armed forelegs are characteristic.
BEETLES (COLEOPTERA)
Banded Long-horned Beetle
Chlorophorus sp.
A handsome beetle whose stem borer larvae are pests on Bamboo.
Spotted Long-horned Beetle
Batocera sp.
Beetles of this group have their antennae longer than their body. Stem borer larvae are pests on trees.
7-spotted Lady Bird Beetle
Coccinella septempunctata
This attractive beetle is a beneficial insect. Both adults and larvae feed on aphides.
Fire Fly (Glow Worm)
Unlike male, the female firefly beetle is wingless and predaceous. Both sexes emit green light for communication.
Click Beetle
Lanelater sp.
A nocturnal beetle with unusual trait of 'clicking' When handled, it arches its body and swings into the air with a
Azure Tiger Beetle
Jansenia azureocincta
A tiny ground dwelling predatory beetle. Known for its speed. It is equipped with powerful mandibles and large eyes. Commonly seen in the beginning of rains.
GRASSHOPPERS & CRICKETS (ORTHOPTERA)
Katydid
Mecopoda elongata
Large, nocturnal bush cricket. Feeds on plant and animal matter. Male chirps sound like "Katy did".
Field Cricket
Gryllodes melanocephalus
Common nocturnal cricket in the forests. Males chirp continuously by rubbing their wings.
Bark Bush Cricket
Sathrophyllia rugosa
This cryptic coloured long horned grasshopper remains motionless on tree bark to escape from predators.
Banded Grasshopper
Epacromia sp.
Common grasshopper with short antennae. Males chirp by rubbing hindlegs on wings.
Leaf Bush Cricket
Holochloro sp.
A leaf-like, long-horned grasshopper. Usually seen resting in the centre of a leaf to merge itself. Eggs laid inside plant stems.
Hooded Grasshopper
Teratodes monticollis
Enlarged flattened thorax or the leaf-like "hood" provides good camouflage for this short-horned grasshopper.
INSECT HOMES
Insect Galls
Galls are hollow outgrowths of plant tissues caused by gall insects to rear their young ones. Insects like wasps, midges, flies, thrips and bugs cause gall formations.
Pagoda Ant
Crematogaster dohrni
A curious looking structure usually built on tree tops. The red ants are ferocious and guard their nest vigilantly. The nest is made up of bark paste prepared by the ants.
Harvester Ant
Pheidole sp.
A masterpiece of architecture. The walls around the nest ensure proper drainage and protect the nest. The black ants store seeds inside the nest during summer and use them as food in monsoon.
Termite
Termes obesus
Termitarium- house of a termite built by a soil dwelling termite found here. It maintains fungus gardens inside the mound and has a well defined hierarchal society.
Spittle Bug
Clovia sp.
Not human spit but cuckoo's spit. That's the other name of the baby's home. The baby secretes liquid and whips it into foam and stays inside it. Seen only during rains
BEETLES (COLEOPTERA)
Greater Jewel Beetle
Chrysochroa chinesis
Metallic iridescent beetle seen during monsoon inside forests. Eggs are laid inside tree trunks.
Tortoise Shell Beetle
Aspidomorpha milliaris
A handsome beetle with large protective, transparent shield over its body. A plant eating beetle whose larvae curiously load their backs with forest litter to remain disguised.
Blister Beetle
Mylabris pustulata
Voracious flower feeding beetle. Bright colours warn predators to keep off. Yellow oily secretion from leg joints cause blistering.
Lesser Jewel Beetle
Psiloptera fastuosa
A handsome beetle seen flying over tree canopies. Adult are leaf feeders while larvae are stem borers.
Dung Roller Beetle
Heliocopris bucephalus
A scavenger that feeds and breeds on animal dung. Males roll up dung balls and females lays their eggs inside it.
Cock Chafer
Anomala varians
A common nocturnal beetle. Exudes obnoxious odour and plays dead when alarmed. Larvae can be pests on roots of cereal crops.
MIXED GROUP (NEUROPTERA, THYSANURA, DERMAPTERA, MECOPTERA)
Spotted Ant Lion
Myrmeleo singulare
Dragonfly-like insect active during evenings. Larvae make conical holes of slopping loose soil to trap ants. Hence the name.
Mantis Fly
Mantispa sp.
A dainty insect resembling praying mantis but lacks long neck. Eggs laid on silk stalks. Larvae parasitic on spider eggs and spiderlings.
Owl Fly
Helicomitus dicax
Resembles a dragonfly but has long clubbed antennae. Active in evenings to hunt for small insects.
Brown Bristle Tail
Lepisma sp.
Common ground dwelling flat insect. Seen scurrying beneath the leaf litter. Feeds on starchy and sugary matter.
Yellow Earwig
Labidura sp.
A secretive, ground dwelling, scavenging insect. Loves moisture and shuns light. Pincers on the tail end used in defence.
Scorpion Fly
Neopanorpa furcata
A strange carrion feeding insect with trunk like mouth. Curled abdomen of the male looks like a scorpion's tail.
INSECT HOMES
Mud Dauber Wasp
Sceliphron madraspatanum
This dainty solitary wasp builds columnar mud cells to store paralyzed spiders as food for its young grubs.
Giraffe Weevil
Apoderus sp.
This group of plant eating beetles make nests by rolling up a single leaf into a packet to lay eggs inside it.
Paper Wasp
Polistes hebraeus
Common social wasp. Chandelier like nests are made with bark paste. Adults feed on nectar. Young grubs are fed with a paste of insects.
Mason Wasp
Eumenes conica
A common solitary wasp. Builds oval mud nests on walls. Nest is stored with paralysed caterpillars as food for its young grubs.
Rock Honey Bee
Apis dorsata
Largest among the Indian honey bees. Large hives are built on trees and cliffs. Pugnacious if disturbed. Valuable pollinator.


MOTHS
OF BNHS RESERVE
Moths, the mysterious elder cousins of butterflies, are equally interesting and important. We present here identifications of 60 common moths seen on our Reserve . It includes name (common* and scientific), wingspan and habits. This is the first time ever such guide has been developed. So enjoy and Happy Mothing!!
* Many common names have been coined for first time
TIGER MOTHS (ARCTIIDAE)
Black Spotted Tiger
Pericallia ricini (♂ 38-50, ♀ 60-68 mm)
The commonest tiger with bright yellow underwings.
The caterpillar is hairy, dark brown speckled with white.
Known to feed on milkweed plants.
Oriental Tiger Moth
Lemyra spilosomata (♂,♀ 42 mm)
One of the smallest among tiger moths where the white markings vary among sexes. Only found in India.
Red Spotted Tiger
Argina argus♂, ♀, 64 mm)
An elusive moth with bright red underwings. The caterpillar purple-black and hairy, feeding on legume and Ficus plants.
Blue Footmen Moth
Oeonistis entella (♂42, ♀ 46 mm)
A unique group of moths with spindle shaped bodies. The underwing is pale yellow. Caterpillars are lichen feeders.
Banded Tiger Moth
Rajendra perrottetii (46 mm)
A handsome tiger moth with crimson underwings.
All related species look similar with the forewing bands varying.
GOAT MOTHS (COSSIDAE), TUSSOCK MOTHS(LYMANTRIIDAE), LAPPET MOTHS (LASIOCAMPIDAE)
Carpenter Goat Moth
Xyleutes persona (♂ 98-128, ♀180 mm)
A large non-feeding moth with long body. The wing patterns vary among sexes. The caterpillar is a stem borer of legume plants.
Mathura Tussock Moth
Lymantria mathura (♂ 40-54, ♀ 96-112 mm)
A sluggish non-feeding moth. The sexes differ in appearance. The females lay eggs in clusters and cover them with silk. Caterpillars have dorsal tufts of hair on their bodies.
Vishnu Lappet Moth
Trabala vishnu (♂ 50-60, ♀ 80-90 mm)
A common non-feeding moth with patterns varying within sexes. The caterpillars feed on Terminalia plants. The cocoon is like a small purse with irritating hairs embedded in it.
Leaf Lappet Moth
Arguda flavovitta (♂ ♀ 80 mm)
A leaf like moth with unique resting posture where the forewings are pulled behind and hindwings come forward. A non-feeding moth with hairy caterpillars that have lateral tufts of hair.
Red tailed Lappet Moth
Lebeda nobilis (♂ 96-120, ♀ 138-148 mm)
An unsual lappet moth with long abdomen. Sexual dimorphism is noted in females which are more uniform red-brown varying to grey-brown.
GEOMETER MOTHS (GEOMETRIDAE)
Tailed Emerald Moth
Agathia laetata (♂,♀ 38 mm)
A beautiful moth with pointed hindwings. The body colouration breaks the body image in wild environment. The caterpillar feeds on Oleander plant.
Banded Geometer
Chaisnia fasciata (42 mm),
A common moth where males are darker than females. The caterpillar is green or brown with yellow stripes. It feeds on Mimosa and Acacia plants.
Hooktip Geometer
Hyposidra talaca (♂44, ♀ 54-60 mm)
A dry leaf like moth where males have hooked wing tips and are seen resting on bushes. The caterpillar is pinkish, olive-green with black patches. It is considered a pest as it feeds on a variety of commercial plants.
Lichen Moth
Amblychia hymenaria (♂, ♀ 84-104 mm),
A cryptic moth usually seen resting on tree trunks where it merges with the surroundings as lichens on the bark. The females are larger than males.
Yellow Leaf Moth
Eumelea ludovicata (♂,♀ 50 mm),
A striking moth where the males are brighter than females. The moth camouflages itself as a fallen leaf. The caterpillars feed on Macaranga plant.
GRASS MOTHS (CRAMBIDAE)
Coral Tree Moth
Agathodes ostentalis (♂,♀ 26-40 mm)
A beautiful, tiny moth which curls up the tip of it's abdomen while resting. The caterpillars are dark brown with yellow lines. They feed in groups on Coral tree by making webbed shelters out of the young shoots.
Silver Grass Moth
Diaphania indica (♂,♀ 24-28 mm)
A small and shiny moth whose males have anal tufts at the tip of their abdomens. The caterpillars feed on cotton plants.
Yellow Grass Moth
Botydes asialis (♂, ♀ 50 mm)
A large and handsome moth where males usually have anal tufts at the tip of their abdomens. The caterpillar is short and thick; olive-green with reddish lateral band. They feed on Ficus plants.
Leaf Webber Moth
Nausinoe gemoentalis (♂,♀ 26 mm)
A dainty, tiny, beautiful moth.
The caterpillars feed in groups on Jasmine plants.
Spotted Grass Moth
Pygospila tyres (♂, ♀ 42-46 mm)
A common and large moth from the group. The caterpillars feed on milkweed plants by curling up the leaves.
BNHS
THIS FIELD GUIDE HAS BEEN DEVELOPED THROUGH FUNDING FROM MMR-ENVIRONMENT IMPROVEMENT SOCIETY.
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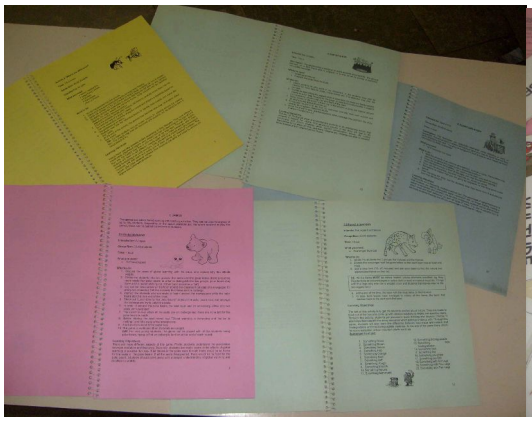
MMR ENVIRONMENT IMPROVEMENT SOCIETY
SLUG MOTHS (LIMACODIDAE), PROMINENT MOTHS (NOTODONTIDAE)
Green Slug Moth
Parasa lepida (♂, ♀ 30, f 42-50 mm)
A tiny and stout non-feeding moth. The spiny slug-like caterpillar is greenish with mauve stripes. It makes brown, tough, papery oval cocoon. They feed on Mitragyna plants.
Brown Slug Moth
Cania bilinea (♂,♀ 34 mm)
A tiny and stout non-feeding moth. The patterns vary among sexes. Caterpillar feeds on banana plant.
White Arches Prominent Moth
Neocerura liturata (♂ 46-70, ♀ 62-90 mm)
A non-feeding moth with white underwings. The patterns vary within species. Caterpillar feeds on Flaucortia plant.
Netria Prominent Moth
Netria viridescens (♂ 50-70, ♀ 82-100 mm)
A large furry non-feeding moth. Males have feathery antennae and are smaller, darker than females. The caterpillar is thickest in the middle and has bifid tail segment.
Buff Tip Prominent Moth
Phalera grotei (♂ 76, ♀ 82 mm)
An unusual non-feeding moth that resembles a broken twig when resting on a branch. The caterpillar is warty and very brightly coloured.
SWALLOWTAIL MOTHS (URANIIDAE)
Spotted Swallowtail moth
Micronia aculeata (♂, ♀ 42-50 mm)
An interesting moth with fake head like markings on the hindwing tip which gives it an advantage to evade predatory attacks. The moth always rests on the leaf which appears like a splash of bird dropping.
Bar Swallowtail Moth
Orudiza protheclaria (♂,♀ 36 mm)
An inconspicuous moth with fake head like markings very prominently visible. For protection it relies heavily on these markings.
Whiteline Swallowtail Moth
Phazaca leucocera (♂,♀ 22 mm)
A unique small moth with hindwings folded apart which gives it a crinkled leaf look. Exclusively found in India and Sri Lanka.
Spotted Decetia Moth
Decetia subobscurata (♂ ♀ 50 mm)
A dry leaf-like moth where the patterns differ between the sexes. Females are more red. Exclusively found in India and Myanmar.
Decetia leaf Moth
Decetia numicusaria (♂, ♀ 40, 44 mm)
A dry leaf-like dainty moth which usually rests on green leaves. If disturbed the moth readjusts itself on the surface. The patterns vary among the sexes.
DAY FLYING MOTHS (AGARISTIDAE, SPHINGIDAE, ZYGAENIDAE)
Painted Handmaiden Moth
Euchromia polymena (♂ 44, ♀ 52 mm)
The most colourful among handmaiden moths. Caterpillars are densely hairy with orange and black hairs. Feeds on Red Glory plant.
Hummingbird Hawkmoth
Macroglossum particolor (♂ 56, ♀ 60 mm)
A day flying moth which has the ability to hover in front of flowers while seeking nectar. Caterpillar feeds on Morinda plant.
Bee Hawkmoth
Cephanodes hylas (♂,♀ 60-73 mm)
A day flying moth which resembles a bee. The white scales on the wing are shed on emergence to get the perfect bee look. Caterpillar feeds on Gardenia plants.
Blue Burnet Moth
Etenusia aerdea (♂,♀ 65 mm)
A bright day flying moth which could be mistaken for a wasp. The antennae are very characteristic. The body patterns vary among sexes.
Yam Forester Moth
Episteme adulatrix (♂,♀80 mm)
A striking day flying moth, seen during rains. The flurry flight distinguishes itself from butterflies. Caterpillar feeds on yam plants.
HAWKMOTHS (SPHINGIDAE)
Grape Hawkmoth
Theretra clotho (♂,♀ 80-100 mm)
A large hawkmoth whose underwings are black. Caterpillars feed on wild grapes.
Convolvulus Hawkmoth
Agrius convolvuli (♂,♀ 80-120 mm)
A migratory hawkmoth with 12 cm long proboscis. The body patterns are variable. Caterpillars feed on Convolvulus plants.
Golden Striped Hawkmoth
Theretra lycetus (♂ 70-74,♀ 70-76 mm)
A beautiful moth seen during rains. Caterpillar feeds on Leea plants and has many eye-like spots along the body.
Spotted Marumba
Marumba dyras (♂52 mm, ♀60 mm)
The commonest non-feeding hawkmoth seen during rains. The males curl up their abdomens and females are larger. Caterpillars feed on Red Silk cotton plants.
Short Horned Sphinx
Clanis phalaris (♂102-130, ♀102-160 mm)
The largest hawkmoth seen here. The caterpillar lacks typical tail horn. A non-feeding moth with short lifespan. Caterpillar feeds on Indian Kudzu plant.
OWL MOTHS (NOCTUIDAE)
Buff Stripe Moth
Hulodes carnea (♂ ♀ 90 mm)
A common, inconspicuous moth seen resting among leaf litter. Caterpillar is a semi looper with two pointed tubercles on tail segment. It feeds on milkweed plants.
White Spotted Asota
Asota caricae (♂62-67 mm, ♀ 72-76 mm)
A common moth seen during rains resting among bushes. The caterpillar is smooth, yellow with black and white stripes. They pupate within a curled leaf of foodplant i.e. Ficus plants.
Bird Dropping Moth
Chasmina fasciculosa (♂ ♀ 36 mm)
An unusual moth with patterns of bird dropping. It rests above the leaf and no bird dares to peck it. Patterns vary among sexes.
Skipper Moth
Egnasia ephyrodalis (♂, ♀ 38 mm)
An unusual small moth which rests like a skipper butterfly. Caterpillar feeds on Randia plants.
Manlia Moth
Ischyja manlia (♂ 80-100,♀ 96-112 mm)
A cryptic moth with bluish flash colouration on its hindwing. Caterpillar is purplish-brown with conical tubercles and feeds on Terminalia and Cinnamon plants.
EMPEROR MOTHS (SATURNIIDAE), MONKEY MOTHS (EUPTEROTIDAE)
Atlas Moth
Attacus traprobani (♂ 224, ♀ 250 mm)
The largest among moths of the world. A non-feeding moth with a lifespan of few weeks. The males have feathery antennae. Robust blue caterpillars which feed on a variety of plants for a month.
Tasar Silk Moth
Antheraea paphia (♂118-158 mm, ♀115-188 mm)
Commonest non-feeding emperor moth whose cocoons are used commercially for tasar silk production. Robust green caterpillars mainly feed on Zizyphus plants.
Moon Moth
Actias selene (♂123-166 mm, ♀128-173 mm)
Only emperor moth with tails. Tails of males are curly. A non feeding moth with short lifespan. Robust green caterpillar feeds on Lannea plants.
Leaf Monkey Moth
Ganisa similis (♂,♀ 68 mm)
An unusual non-feeding monkey moth which looks like a rotten leaf. When handled, it plays dead. Males have feathery antennae.
Yellow Monkey Moth
Eupterote lineosa (♂ 70-82,♀ 85-90 mm)
Commonest monkey moth seen in the beginning of rains. A non feeding moth where the body patterns vary among sexes. Caterpillars are densely hairy.
HAWKMOTHS (SPHINGIDAE)
Greater Death's head Hawkmoth
Acherontia lachesis (♂ ♀ 102-132 mm)
A dreadful looking moth with skull marking on its thorax. Interestingly the adult, caterpillar and pupa squeak when disturbed. Caterpillar feeds on Solanum plants.
Greater Yam Hawkmoth
Theretra nessus (♂90-120,♀94 -130 mm)
A robust hawkmoth with well camouflaged body colours. Caterpillars feed on yam plants.
Carpenter Bee Hawkmoth
Sataspes tagallica f. hauxwelli (♂,♀ 66 mm)
A bee-like hawkmoth which is a new discovery for India. Caterpillars feed on Dalbergia plants.
Pink Agnosia
Agnosia orenas (♂ 60-74, ♀66-87 mm)
A small hawkmoth with pinkish underwings. The body patterns vary among the sexes. Caterpillar feeds on Grewia plants.
Dentate Grey Sphinx
Psyllptychus dentatus (♂ 92-108, ♀ 116-120 mm)
Bears close resemblance to Marumba hawkmoth.
A non-feeding moth with caterpillars feeding on Cordia plant.
OWL MOTHS (NOCTUIDAE)
Owl Moth
Erebus macrops (♂,♀ 134-160 mm)
A large cryptic moth with owl-like eye markings on the wings. Adult feeds on ripe fruits.
Fruit piercing Moth
Eudocima materna (♂,♀ 96 mm)
A cryptic moth with bright yellow underwings which are used to startle the predators. They have pointed proboscis which are capable of piercing ripe fruits. Caterpillars feed on Citrus plants.
Crimson Underwing
Thyas honesta (♂,♀ 84-104 mm)
A handsome moth with crimson underwings. The adult readily comes to fruit baits. Caterpillar feeds on Quisqualis and Terminalia plants.
Spotted Leaf Moth
Hamodes auurantiaca (♂,♀ 60-66 mm)
A dry leaf-like moth where the markings vary among sexes. Males are brighter. Exclusively known from India and Myanmar.
Owlet Moth
Spirama retorta (♂64-76, ♀66-88 mm)
A smaller version of the Owl moth. The females are brighter and larger. The eye-spots on the wings help the moth to evade predatory attacks from birds.

IV. EDUCATIONAL TRUNKS (Manuals, Puppets, Quiz Cards, Game Cards**)**

Bombay Natural History Society: Conservation Education Centre



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